

(28,184)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1921.

No. 270.

BREWER-ELLIOTT OIL & GAS COMPANY ET AL.,
APPELLANTS,

vs.

THE UNITED STATES OF AMERICA AND GYPSY OIL
COMPANY.

APPEAL FROM THE UNITED STATES CIRCUIT COURT OF APPEALS
FOR THE EIGHTH CIRCUIT.

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Pleas and proceedings in the United States Circuit Court of Appeals for the Eighth Circuit, at the December Term, 1920, of said Court, before the Honorable Walter H. Sanborn and the Honorable John E. Carland, Circuit Judges, and the Honorable Thomas C. Munger, District Judge.

Attest:

[Seal of United States Circuit Court of Appeals, Eighth Circuit.]

E. E. KOCH,
*Clerk of the United States Circuit Court of
 Appeals for the Eighth Circuit.*

Be it Remembered that heretofore, to-wit: on the twenty-sixth day of June, A. D. 1919, a transcript of record pursuant to an appeal allowed by the District Court of the United States for the Western District of Oklahoma, was filed in the office of the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit, in a certain cause wherein Brewer-Elliott Oil & Gas Company, et al., were Appellants, and United States of America, et al., were Appellees, which said transcript as prepared and printed in pursuance of the stipulation of the parties for the use of the Court upon the hearing of this cause under the rules of the United States Circuit Court of Appeals for the Eighth Circuit, under the supervision of its Clerk, is in the words and figures following, to-wit:

a (Stipulation as to printing records and certain original exhibits, etc.)

United States Circuit Court of Appeals, Eighth Circuit.

Brewer-Elliott Oil and Gas Company, a corporation, et al.,
Appellants,

No. 5434 vs.

United States of America and the Gypsy Oil Company, a
corporation,
and

Commissioners of the Land Office of the State of Oklahoma,
et al., Appellants,

No. 5435 vs.

United States, G. W. Hutchings, E. C. Mullendore and J. W.
Ortner.

Appeals from the District Court of the United States for the
Western District of Oklahoma.

In these causes the clerk of the District Court in the preparation of the transcripts of the records used and inserted in the transcript of the record in case No. 5434 the original exhibits Nos. 24, 37, 39, 46, 49 and 59, being copies of certain House Documents, etc., which said exhibits were a part of the original files in said Court and the transcript of the record in case No. 5435 is incomplete in that said exhibits called for therein are not made a part thereof.

In order that the files in these cases in the lower Court may be complete and also that the transcripts of the records as certified to this Court may be complete in themselves as to said exhibits and not by reference, It is now here stipulated by and between counsel for the respective parties in these causes that after the record is printed, including the exhibits heretofore referred to in case No. 5434, that then the Clerk of this Court insert in lieu of said original exhibits in the transcript of the record in case No. 5434 printed copies thereof and also insert in the transcript of the record in case No. 5435 printed copies of said exhibits where the exhibits are

called for, and that with the permission of this Court
b the said original exhibits as contained and made a part
of the transcript of the record in case No. 5434 may
then be by the Clerk of this Court returned to the Clerk of the
said District Court.

Inasmuch as the Statements of the Evidence as contained
in each of the transcripts of the records in these causes are
identical and to save expense in the printing of the records,
It is further stipulated that in the printing of the records the
Clerk of this Court is hereby requested and directed to omit
the Statement of the Evidence from the printed record in case
No. 5435 and that upon the hearing and in the determination
of these causes the Statement of the Evidence as contained
in the printed record in case No. 5434 may be considered in
case No. 5435 with the same force and effect as if said state-
ment was contained in the printed record in the latter case.

S. P. FREELING,

Attorney General of Okla-
homa,

Attorney for State of Okla-
homa,

Appellant in No. 4534, and
Commissioners of the
Land Office,

Appellants in Number
5434.

JOHN A. FAIN,

United States District At-
torney for Western Dis-
trict of Oklahoma,

Attorney for United States
of America, Appellee in
No. 5434.

W. A. LEDBETTER,

H. L. STUART,

R. R. BELL,

E. P. LEDBETTER,

Attorneys for Brewer-Elli-
ott Oil & Gas Company,
Pawnee-Osage Oil & Gas
Company, Chick - Osage
Oil & Gas Company,
Number One Oil Com-
pany and C. J. Haskell,
Appellants in No. 5434.

A. F. BOYS,
Attorney for Arkansas
River Bed Oil Company,
Appellant in No. 5434.

JAMES B. DIGGS,
Attorney for Gypsy Oil
Company, one of the ap-
pellees in No. 5434.

S. P. FREELING,
Attorney General of Okla-
homa,
Attorney for Commission-
ers of the Land Office,
Chas. West, sued as At-
torney General of Okla-
homa, and A. P. Crockett,
sued as Special Assistant
of Oklahoma, Appellants
in No. 5435.

JOHN A. FAIN,
United States District At-
torney for Western Dis-
trict of Oklahoma,
Attorney for the United
States, Appellee in No.
5435.

W. A. LEDBETTER,

H. L. STUART,

R. R. BELL,

E. P. LEDBETTER,

Attorneys for Commission-
ers of the Land Office of
the State of Oklahoma,
Charles West, sued as At-
torney General of Okla-
homa, A. P. Crockett,
sued as special assistant
Attorney General of Ok-
lahoma, and Jim Crow
Oil Company, a corpora-
tion, Appellants in No.
5435.

HENRY E. ASP,
HENRY G. SNYDER,
F. B. OWEN and

W. A. LYBRAND,
Attorneys for W. H. Ed-
minston, Martha J.
Thomas, Administratrix
of the estate of H. A.
Thomas, deceased, Ap-
pellees in No. 5435, and
E. C. Mullendore one of
Appellees in No. 5435.

Endorsed: Filed in the U. S. Circuit Court of Appeals,
August 25, 1919.

1 (Citation and Acceptance of Service.)

In the District Court of the United States for the
Western District of Oklahoma.

United States of America, Plaintiff,
No. 75 vs.

The Brewer-Elliott Oil & Gas Company, a corporation; Paw-
nee-Osage Oil & Gas Company, a corporation; Chick-
osage Oil & Gas Company, a corporation; Number One
Oil Company, a corporation; Arkansas River Bed Oil
& Gas Company, a corporation; the Scioto Oil Com-
pany, a corporation; the Gypsy Oil Company, a cor-
poration, and C. J. Haskell, Defendants.

The State of Oklahoma and the Commissioners of the Land
Office of the State of Oklahoma, Intervenors.

The United States of America to the United States of Amer-
ica and the Gypsy Oil Company, a corporation,—Greet-
ing:

You and each of you are hereby cited and admonished to
appear in the United States Circuit Court of Appeals for
the Eighth Circuit at the city of St. Louis sixty days from
and after this citation bears date, pursuant to an appeal filed
in the Clerk's office of the District Court of the United States
for the Western District of Oklahoma, wherein the Brewer-
Elliottt Oil & Gas Company, a corporation, Pawnee-Osage
Oil & Gas Company, a corporation, Chickosage Oil & Gas
Company, a corporation, Number One Oil Company, a cor-
poration, Arkansas River Bed Oil & Gas Company, a corpora-
tion, C. J. Haskell, the State of Oklahoma, and the Commis-
sioners of the Land Office of the State of Oklahoma are ap-
pellants and you, the United States of America, and the
Gypsy Oil Company are appellees, to show cause, if any there

be, why the judgment rendered against the said appellants in said appeal mentioned should not be reversed and why speedy justice should not be done the parties in their behalf.

Witness the Honorable John H. Cotteral, Judge of the District Court of the United States for the Western District of Oklahoma, on this the 20th day of August, in the Year of Our Lord, Nineteen Hundred and Eighteen.

JOHN H. COTTERAL,
United States District Judge
for the Western District of
Oklahoma.

2 Service accepted on this the 20th day of August, 1918.

JOHN A. FAIN,
United States District Attorney
for the Western District of Oklahoma,
Attorney for the United
State of America.

JAMES B. DIGGS,
Attorney for the Gypsy Oil Company.

Endorsed: Filed in the District Court on August 20, 1918.

3

(Bill of Complaint.)

The United States of America, Plaintiff,
vs.

The Brewer-Elliott Oil and Gas Company, a corporation;
Pawnee-Osage Oil and Gas Company, a corporation;
Chickosage Oil and Gas Company, a corporation;
Number One Oil Company, a corporation; Arkansas
River Bed Oil and Gas Company, a corporation; The
Scioto Oil Company, a corporation, Defendants.

To the Honorable, The Judge of the District Court of the
United States for the Western District of Oklahoma.

The United States, by Isaac D. Taylor, United States Attorney for the Westren District of Oklahoma, at the instance and request of the Secretary of the Interior, and by direction of the Attorney General of the United States, for itself, and as trustee and Guardian for the Osage Tribe of Indians in Oklahoma, brings this, its Bill of Complaint against the defendants above named, whose more full names are to the Complainant unknown, and for cause of action against the defendants, plaintiff compains and says:

First. That of all the above mentioned and hereinafter named defendants are corporations organized and existing under the laws of the State of Oklahoma, and are citizens and residents of said State; that the said Brewer-Elliott Oil and Gas Company, a corporation has its principal place of business at Oklahoma City, in the Western District of Oklahoma; that the said Pawnee-Osage Oil and Gas Company, a corporation, has its principal place of business at Pauls Valley, in the Eastern District of Oklahoma; that the said Chick-

4 osage Oil and Gas Company, a corporation, has its principal place of business at Osage, in the Western District of the State of Oklahoma; that the said Number One Oil and Gas Company, a corporation has its principal place of business at Muskogee, in the Eastern District of the State of Oklahoma; that the said Arkansas River Bed Oil and Gas Company, a corporation, has its principal place of business at Cushing, in the Western District of the State of Oklahoma; that the said The Scioto Oil Company, a corporation, has its principal place of business at Tulsa, in the Eastern District of the State of Oklahoma; that each of said corporation defendants is an inhabitant of the District in which it has its principal place of business aforesaid.

Second. That pursuant to certain treaties between the Cherokee Nation of Indians and the United States, and the Osage Tribe of Indians and the United States, and pursuant to laws of the United States, and especially pursuant to the Act of Congress entitled "An Act to confirm to the Great and Little Osage Indians, a Reservation in Indian Territory," approved June 5, 1872, there was provided, set apart and confirmed to the Osage Tribe of Indians in the then Indian Territory, said Tribe comprising what was known as the Great and Little Osages, as their reservation the following described tract or body of land, namely:

Bounded on the east by the Ninety-sixth (96) Meridian, on the South and West by the North line of the Creek Country, and the Main Channel of the Arkansas River, and on the North by the South line of the State of Kansas.

That said Act of June 5, 1872, further provided that the said Osage Tribe of Indians should permit the settlement within the limits of said tract of land of the Kansas Tribe of Indians, subject to certain conditions therein set forth.

That said reservation so confirmed, set apart and secured to said Osage Tribe of Indians, was purchased by said
5 Osage Tribe, under authority of the United States from the Cherokee Nation of Indians and paid for by said Osage Tribe under authority of law and especially under the Act of March 3, 1883, (17 Stat. L. 538).

That said Osage Reservation was extended and enlarged by the Act of Congress entitled, "An Act making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, eighteen hundred eighty-four, and for other purposes," approved March 3, 1883, (22 Stat. L. 603, 624).

Third: That said Act of March 3, 1883, provided for payment to the Cherokee Nation for certain lands west of the Arkansas River, provided that the Cherokee Nation, through its proper authorities, should execute conveyances satisfactory to the Secretary of the Interior, to the United States in trust only for the benefit of the Pawnee, Poncas, Nez Perces, Otoes and Missourias and Osages, then occupying said tracts as they respectively occupied the same before the payment of the said sum of money appropriated in payment therefor.

That pursuant to law and said Act of March 3, 1883, the Cherokee Nation of Indians did on to-wit, June 14, 1883, for a good and sufficient consideration to-wit, theretofore paid, executed a deed to the United States in trust for the use and benefit of the Osage Tribe of Indians, including therein the said additional lands purchased for the Osages under said Act of March 3, 1883, said deed also including the said lands purchased by the Osages and confirmed to them as their reservation by the said Act of June 5, 1872, except as to a certain part of the said Osage Indian Reservation which had theretofore been set apart in accordance with law for the Kansas Tribe of Indians, the said deed describing the said lands therein conveyed for the use and benefit of the Osages as follows:

6 "All those certain tracts of land lying and being in the Indian Territory, embracing the following townships, and fractional townships, north and east of the Indian meridian, the fractional townships being on the left bank of the Arkansas River;

Fractional township twenty-four (24), Twenty-five (25); and twenty-six (26), range two (2) east; fractional townships twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), twenty-

nine (29), range three (3), east; fractional townships twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), and twenty-seven (27), township twenty-eight (28), and fractional township twenty-nine (29), range four (4), east; fractional townships twenty-three (23), and twenty-four (24), townships twenty-five (25), Twenty-six (26), twenty-seven (27), twenty-eight (28), and fractional township twenty-nine (29), range five (5), east; fractional townships twenty-two (22), and twenty-three (23), townships twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), and fractional townships twenty-nine (29), range six (6), east; fractional townships twenty-one (21), and twenty-two (22), townships twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), and fractional township twenty-nine (29), range seven (7), east; fractional townships twenty-one (21), and twenty-two (22) townships twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), Twenty-eight (28), and fractional township twenty-nine (29), range eight (8), east; fractional townships twenty (20), and twenty-one (21), townships twenty-two (22), twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28) and fractional township twenty-nine (29), range nine (9), east; fractional township twenty (20), townships twenty-one (21), twenty-two (22), twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), and fractional township twenty-nine (29), range ten (10), east; fractional township twenty (20), townships twenty-one (21), twenty-two (22), twenty-three (23), twenty-four (24); twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), and fractional township twenty-nine (29), range eleven (11), east; fractional townships twenty (20), twenty-one (21), twenty-two (22), twenty-three (23), twenty-four (24), twenty-five (25), twenty-six (26), twenty-seven (27), twenty-eight (28), and twenty-nine (29), range twelve (12), east; according to a plat of lands annexed hereto, marked "A" and made a part of this conveyance; containing in all one million, five hundred and seventy thousand, one hundred and ninety-six and thirty hundredths acres, (1,570,196.30) hereby granted.

That the said deed also conveyed to the United States, in trust for the use and benefit of the said Osage Tribe of Indians, the islands in the Arkansas River opposite to the lands described in the said deed and conveyance to the said

7 Osage Tribe, except Beaver and Turkey Islands, in Township twenty-three (23), North, of Range Three

(3), East, and said Island, with the exception of Beaver and Turkey Islands mentioned, were made a part and parcel of the lands set apart for the Osage Tribe of Indians; and included in and covered by said deed. That said deed was not intended to, and did not, limit or diminish the lands passing to the Osage Tribe of Indians under the said Act of June 5, 1872, except as to the lands therein mentioned which were conveyed to the Kansas Tribe of Indians.

Fourth: That the said Osage Tribe of Indians entered into the possession of the said lands so set aside, confirmed and conveyed as its reservation and continued to so occupy and use the same until said reservation was allotted in severalty, as hereinafter set forth. That the said Osage Tribe of Indians, at all times herein mentioned and with the authority of the United States continued in and possessed a tribal existence, subject, however, to the paramount authority of the United States.

Fifth: That on June 28, 1906, there was duly enacted an Act of Congress entitled "An Act For the Division of the Lands and Funds of the Osage Indians in Oklahoma Territory, and for other purposes." (34 Stat. 539) That under and by virtue of the provisions of said Act, commonly called the Osage Allotment Act, the lands comprised in the said Osage Indian Reservation, formerly in the Indian Territory and thereafter in Oklahoma Territory and thereafter in the State of Oklahoma, were duly allotted among the members of said Tribe as in said Act provided, said Act, however, providing that the oil, gas, coal and other minerals covered by the lands for the selection and division of which provision was therein made, were thereby reserved to the Osage Tribe for a period of twenty-five years from and after the 8th day of April, 1906, and that leases for all oil, gas and other minerals covered by selections and division of land therein provided for
8 may be made by the Osage Tribe of Indians through its Tribal Council, and with the approval of the Secretary of the Interior, and under such rules and regulations as he may prescribe, and providing also that the royalty to be paid to the Osage Tribe under any mineral lease so made, shall be determined by the President of the United States. Said Osage Allotment Act further providing for a tribal existence of said Osage Tribe for twenty-five years from the date of said Act.

Sixth: That under and by virtue of the aforesaid treaties, Acts and deed, the United States holds all of the oil, gas, coal and other minerals covered by the said lands constituting

the Osage Indian Reservation, and especially as covered by the lands described in the said confirmatory Act of June 5, 1872, in trust for the said Osage Tribe of Indians, and said Tribe is the owner thereof subject to the supervision and control of the plaintiff, and the said mineral interests so held in trust, as aforesaid, extend to and are bounded on the south and west by the Creek Country and the main channel of the Arkansas River.

Seventh: That under the lands covered by said Osage Indian Reservation valuable deposits of minerals, to-wit, oil and gas have been found and particularly in Township Twenty (20) North, Ranges Nine (9), and Ten (10) East; Township Twenty-one (21) North, Ranges Seven (7), Eight (8) and Nine (9) East; Township Twenty-two (22) North, Ranges Six (6), Seven (7) and Eight (8) East. •

Eighth: That on or about the 14th day of October, 1913, the Commissioners of the land office of the State of Oklahoma, purporting to act under and in pursuance of the authority of the State of Oklahoma, but without the consent or authority of the United States, and without the consent or authority of said Osage Tribe of Indians, and without the approval or consent of the Secretary of the Interior, executed to and in favor of the defendant the Brewer-Elliott Oil & Gas Company an instrument of writing purporting to be an oil and gas mining lease upon lands therein described as follows, to-wit:

The tract of land lying between the Counties of Payne and Osage, in the State of Oklahoma, to-wit, all that portion of the bed of the Arkansas River, below high-water mark, except Turkey Island; beginning at a point where the section line between sections Twenty-five (25) and Twenty-six (26), Township [Twenty-one] (21) North, Range Eight (8), East Indian Meridian, if projected, would cross said River; thence down said stream to where the same crosses the section line, if projected, between Sections Thirty (30) and Thirty-one (31), Township Twenty-one (21) North, Range Nine (9), East, Indian Meridian.

A copy of the said instrument of writing is hereto attached for convenience, and made a part hereof, and marked "Exhibit A",

That on or about the 3rd day of November, A. D., 1913, the said Brewer-Elliott Oil & Gas Company executed to and in favor of the defendant, the Pawnee-Osage Oil & Gas Company, an instrument in writing purporting to be an assignment of an

undivided one-half interest in the said purported oil and gas mining lease referred to as "Exhibit A" insofar as the same pertained to all that portion of the bed of the Arkansas River below high-water mark, except Turkey Island described therein as follows:

Beginning at a point where the range line between Ranges eight (8) and Nine (9) East cross said River; thence down said River a distance of about one mile to a point where the section line between Sections Thirty (30) and Thirty-one (31) would cross said stream, all in Township twenty-one (21) North, Range Nine (9) East Indian Meridian.

A copy of the said last mentioned instrument of assignment is hereto attached for convenience and made a part hereof and marked "Exhibit B".

That on or about the 25th day of March, A. D., 1914, the said Defendant, the Brewer-Elliott Oil & Gas Company
10 executed a purported assignment to and in favor of the defendant, the Chickosage Oil & Gas Company, of all the purported rights, title and interest of the assignor in and to the lands therein described as follows:

That portion of the bed of the Arkansas River below high-water mark, excepting Turkey Island, beginning at a point where the section line between Sections Twenty-five (25) and Twenty-six (26), Township Twenty-one (21) North, Range Eight (8), East, if projected, would cross said River; thence down said stream to the point where the range line between Ranges Eight (8) and Nine (9) East, if projected, would cross said stream, between sections Twenty-five (25), Township Twenty-one (21) North, Range Eight (8) East, and Section Thirty (30) Township Twenty-one (21) North, Range Nine (9) East, of the Indian Meridian in Oklahoma, (Osage County lying on the North of said stream and Pawnee County on the South thereof.)

A copy of which last mentioned instrument of assignment is attached hereto for convenience and made a part hereof and marked "Exhibit C".

Eighth: That on or about the first day of October, 1913, the Commissioners of the Land Office of the State of Oklahoma, purporting to act under and in pursuance of the laws of the State of Oklahoma, but without the consent or authority of the plaintiff, or of the Osage Tribe of Indians, and without the consent or approval of the Secretary of the Interior, executed to and in favor of the defendant the Number One

Oil Company, a certain instrument of writing purporting to be an oil and gas mining lease covering lands therein described as follows:

Lying in Osage and Pawnee Counties in the State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River below high-water mark, in Sections One (1), and Twelve (12) and Thirteen (13), Township Twenty-one (T. 21), North, Range Seven (R. 7), East of the Indian Meridian.

A copy of said last mentioned instrument of writing is hereto attached, for convenience, and made a part hereof, and marked "Exhibit D".

11 That on or about the 31st day of October, A. D., 1913, the said Number One Oil Company, executed to and in favor of the defendant the Arkansas River Bed Oil and Gas Company, a purported assignment of all the right, title and interest of the assignor for oil and gas mining purposes in and to said lands therein described, including certain lands therein described as follows:

Tract No. 1. All that portion of the bed of the Arkansas River below high-water mark in Sections One (1), Twelve (12), and Thirteen (13), Township Twenty-one (T. 21), Range Seven (R. 7), East, on the line between Pawnee and Osage Counties, Oklahoma, being about two miles in length.

A copy of said last mentioned instrument of writing is hereto attached for convenience and made a part hereof and marked Exhibit "E".

Ninth: That on or about the first day of October, 1913, the Commissioners of the Land Office of the State of Oklahoma, purporting to act under and in pursuance of the laws of the State of Oklahoma, but without the consent or authority of the plaintiff or the Osage Tribe of Indians, and without the consent or approval of the Secretary of the Interior, executed to and in favor of the defendant the Number One Oil Company, a certain instrument of writing purporting to be an oil and gas mining lease, covering lands therein described as follows:

A tract of land lying in Osage and Pawnee Counties, in the State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River below high-water mark, in Sections Six (6) and Seven (7), Township Twenty-one (T. 21), North, Range Eight (R. 8), East of the Indian Meridian.

A copy of said last mentioned instrument of writing is hereto attached, for convenience, and made a part hereof, and marked Exhibit "F".

That on or about the 10th day of November, 1913, the said Number One Oil Company executed to and in favor of the defendant, The Scioto Oil Company, a certain purported assignment of the assignors right, title and interest in and to certain lands stated therein to be situated between the Counties of Osage and Tulsa (evidently meaning Pawnee County), State of Oklahoma, and therein further described as follows:

All that portion of the Bed of the Arkansas River below high-water mark in Sections Six (6), and Seven (7), Township Twenty-one (T. 21) North, Range Eight (R. 8) East.

A copy of said last mentioned instrument of writing is hereto attached for convenience and made a part hereof, and marked Exhibit "G".

Tenth: That all of the said purported leases and assignments above mentioned were executed without authority of the plaintiff or the Osage Tribe of Indians, and without the consent or approval of the Secretary of the Interior.

Eleventh: That the said Arkansas River, as the plaintiff is informed and verily believes, and so alleges the fact to be, is not and never has been navigable in fact, and is not now and never has been what is known as a navigable stream within the purview of the laws of the United States, where same runs through and by said Osage Indian Reservation.

Twelfth: That under and by virtue of the above mentioned leases and assignments, the defendants are claiming certain right, title and interest in and to the oil and gas in and under the bed of the said Arkansas River, and in said bed north and east of the main channel of said Arkansas River, and within the boundaries of the Osage Reservation as defined by the said Act of June 5, 1872, and plaintiff is informed and verily believes that said defendants and each and all of them, have and are prospecting and drilling for oil and gas in the said Arkansas River Bed, and within the boundaries of the said Osage Indian Reservation, as established by said act of June 5, 1872, and are threatening to continue so to do, and said prospecting and drilling for oil and gas on said lands is without the authority of the plaintiff, or the said Osage Tribe of Indians, or the Secretary of the Interior, That said defendants, or some of them, as plaintiff is informed and believes, and so alleges the fact to be, the par-

ticular ones being to the plaintiff unknown, are erecting structures and oil derricks in the bed of the Arkansas River and within the limits of said Osage Indian Reservation, as defined by said Act of June 5, 1872, and said structures and oil derricks are an obstruction to navigation, if said stream be navigable, and have been erected and are so continued without submission of the plans therefor to the Chief of Engineers of the War Department, and without being authorized by the Secretary of War, and without being affirmatively authorized by Congress; that the particular defendant companies which the defendant is informed and believes are so erecting and continuing said structures, are the Brewer-Elliott Oil and Gas Company, the Pawnee-Osage Oil and Gas Company, the Arkansas River Bed Oil and Gas Company, and The Scioto Oil Company. That in the event said river should be held navigable, the erection and continuance of said obstructions, derricks, and structures are wholly unauthorized and contrary to the laws of the United States, as aforesaid, and said derricks and structures being obstructions as aforesaid, are subject to be abated and removed by injunction duly issued from this court upon suit instituted under the direction of the Attorney General of the United States as herein brought and prayed for.

Thirteenth. That the State of Oklahoma, as plaintiff verily believes, has no proprietary title or interest in the bed of said Arkansas River, and is wholly without power or authority to convey or confer by lease or otherwise any proprietary interest or title in such bed and particularly in or to that portion of the bed of the Arkansas River within the
14 limits of said Osage Indian Reservation as defined and established by the said Act of June 5, 1872, that even though said Arkansas River should be held navigable, then and in that event the State of Oklahoma would not have any proprietary interest or title in the bed thereof and would be wholly without power or authority to lease the same for oil and gas mining purposes or any other purposes not pertaining to the use of said stream for the purposes of navigation and as a public highway; that even should said stream be considered navigable, the title of the State therein would extend only to the use of said stream for purposes of navigation and as a public highway and not to the exercise of any proprietary interest therein, and all proprietary rights in the bed of said stream would and do belong to the riparian owners as provided by the common law and the laws of the United States; that whether said stream be navigable or non-navigable, the United States holds in trust for the use and

benefit of the Osage Tribe of Indians the oil and gas and other minerals in and under all the lands within the boundary of said Indian Reservation as defined by said Act of June 5, 1872, and to the thread of the stream of said Arkansas River between the said thread and the shore lands of the said Osage Indian Reservations as the same existed at the time of the Government survey of said Osage Reservation and contiguous lands in 1871 and 1872.

Fourteenth. That the said defendants and each of them are, as aforesaid, trespassing upon portions of said River bed in prospecting and drilling for oil and gas thereunder belonging to the said Osage Tribe of Indians, as aforesaid, and threaten to continue so to do; that said instruments heretofore referred to and attached hereto and marked "Exhibits A, B, C, D, E, F, and G", have been placed of public record in the office of the Secretary of the Commissioners of the

15 Land Office of the State of Oklahoma, and constitute a cloud on the title of the United States and the Osage Tribe of Indians to that portion of the oil and gas and minerals under the said Arkansas River bed belonging to the said Osage Tribe of Indians and held in trust by the United States, as aforesaid, and are depreciating the value thereof and are hindering the control and supervision of the United States over said minerals and the leasing thereof for the use and benefit of said tribe; that the United States is under the Governmental duty and obligation of protecting the said Osage Tribe of Indians in the premises and is charged with the proper and diligent exercise of its trust in behalf of said Tribe and for the proper performance of its duties in the premises, it is necessary to seek relief from this Court to the end that the defendants herein named should not only be ousted from the possession of said lands and minerals, so held in trust by the United States for the said Tribe of Indians, but that the Court may order that said several instruments of writing, copies of which are hereto attached as Exhibits A, B, C, D, E, F, and G, be surrendered for cancellation and cancelled and the record purged thereof and may forever enjoin the defendants from asserting any interest whatever in said lands and minerals adverse to plaintiff and the said Osage Tribe of Indians.

Fifteenth. That complainant further shows that it has joined in this Bill of Complaint, the several defendants named for the purpose of avoiding a multiplicity of suits to retain the possession of the said oil and gas and minerals belonging to the said Osage Tribe of Indians and held in trust as afore-

said, and to quiet the title thereto, and to avoid a multiplicity of suits to have the said instruments of writing delivered up for cancellation and cancelled insofar as the same effect the said oil and gas and minerals of the said Osage Tribe
16 so held in trust as aforesaid. That the plaintiff and the said Osage Tribe of Indians have no plain, speedy and adequate remedy at law.

To the end, therefore, that the plaintiff may have that relief which it can only obtain in a court of equity, and that the defendants herein may answer the premises, but not under oath or affirmation, (answer under oath or affirmation being herein expressly waived) plaintiff now prays that the defendants, the Brewer-Elliott Oil and Gas Company, Pawnee-Osage Oil and Gas Company, Chickosage Oil and Gas Company, Number One Oil Company, Arkansas River Bed Oil and Gas Company, and the Scioto Oil Company, may be enjoined from committing a continuous trespass upon said River Bed and minerals thereunder so belonging to the Osage Tribe of Indians and held in trust as aforesaid, or entering upon the same or prospecting for or mining or removing oil or gas therefrom; that the above described instruments of writing, copies of which are hereto attached, and marked Exhibits "A, B, C, D, E, F, and G," be ordered surrendered for cancellation and be cancelled and held null and void insofar as same purport to affect or cover or convey the said lands or river bed and minerals thereunder so held in trust by the United States for the Osage Tribe of Indians as aforesaid, and that the defendants and each of them, and all persons claiming by, through or under them, be forever enjoined, from asserting any right, title or interest in or to the said lands, and the oil and gas and minerals thereunder, adverse to the plaintiff and the said Osage Tribe of Indians, and that the title to said lands and minerals be quieted in the United States and said Osage Tribe of Indians; and that this Court compel by its injunction, in due form, the removal of all such derricks and structures and obstructions before mentioned and adjacent to the shore lands of said Osage Reservation and in the
17 bed of said Arkansas River, and within the boundary of said Reservation as established by said Act of June 5, 1872, and that in the meantime and until the further order of this court, said defendants, and their agents, employees, and assigns be enjoined from further prospecting or drilling for oil and gas in said river bed within the limits of said Osage Indian Reservation, as aforesaid, and belonging to said Osage Tribe of Indians, and held in trust by the United States, as

aforesaid; and that plaintiff may have such other and further relief as it may be entitled to in the premises.

And, may it please your Honor to grant unto said plaintiff a writ of subpoena directed to the defendants, the Brewer-Elliott Oil and Gas Company, Pawnee-Osage Oil and Gas Company, Chickosage Oil and Gas Company, Number One Oil Company, Arkansas River Bed Oil and Gas Company, and the Scioto Oil Company, commanding them and each of them, at a certain time and under certain penalties therein to be stated, personally to appear before this court and true, correct and perfect answer make to all and singular the premises and to stand to perform and abide by such further direction and decree as may be entered against them herein, as shall be agreeable to equity, and so complainant will ever pray.

ISAAC D. TAYLOR,
United States Attorney.

18 United States of America,
State of Oklahoma,
Oklahoma County—ss.

Preston A. Shinn, being first duly sworn, on oath states that he is the attorney for the Osage Tribe of Indians; that he has read the foregoing Bill of Complaint and knows the allegations therein stated to be true, except such as are alleged upon information and belief, and as to the facts so alleged, [be] believes them to be true.

PRESTON A. SHINN,

Subscribed and sworn to before me this 8th day of April, A.
D. 1914.

(Seal) ARNOLD C. DOLDE,
Clerk.

19 Exhibit "A".

State of Oklahoma Oil and Gas Mining Lease

This Indenture of Lease, made and entered into in duplicate on this the 14th day of October, 1913, by and between the Commissioners of the Land Office of the State of Oklahoma, hereinafter styled the Lessors, parties of the first part, and The Brewer-Elliott Oil & Gas Company, a corporation, hereinafter styled the Lessee, party of the Second Part:

Witnesseth: That under and in pursuance of the Constitution and the laws of the State of Oklahoma, the said lessors, for and in consideration of the bonus, royalty, covenants and stipulations and conditions herein expressed and hereby agreed to be paid, observed and performed by the said lessees, their successors and assigns, do hereby lease and let unto the said lessee and its successors and assigns for a term of five years from and after the date hereof, all oil deposits and natural gas in or under the following described tract of land lying between the Counties of Pawnee and Osage, in the State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River, below high water mark, except Turkey Island; beginning at a point where the section line between sections 25 and 26, Twp. 21 North, Range 8 East, Indian Meridian, if projected, would cross said river; thence down said stream to where the same crosses the section line, if projected, between sections 30 and 31, Twp. 21 North, Range 9 East, Indian Meridian;

which said lands are public lands belonging to the State, and were by the said Commissioners of the Land Office declared to be valuable for oil and gas purposes, and the said oil and gas deposits therein contained were by the said Commissioners of the Land Office segregated from the surface use and interest therein, with the right to prospect for, extract, pipe, store, refine, and remove such oil and natural gas, with the right to use and keep so much of the surface of said premises

as may be necessary to prospect for, extract, pipe, store, refine and remove such oil and natural gas; including still further the right to use a sufficient amount of such oil and natural gas as fuel, light and power so far as may be necessary to the prosecution of said operation, and with the further right to use any water on said premises that may be necessary to carry on said operation, in consideration whereof the said Lessee hereby agrees to pay a royalty of twelve and one-half ($12\frac{1}{2}\%$) per cent of all oil and gas produced and sold from said premises, and the further consideration of a bonus, in addition to the twelve and one-half per cent royalty above specified, of five hundred and fifty (550) barrels of oil out of the first production had from each well drilled on said premises.

All oil and gas due to the State under this contract shall be delivered by the lessee herein or its assigns, free of cost to the State into pipe lines, tanks, or cars, or settled for, before removing the same from the premises if sold in any other way. Certified copies of Guage Tickets, sales and shipments

to be furnished at the request of the Commissioners or anyone authorized to act for them; gas to be metered on the premises under high pressure unless some other method of gauging and measuring same shall be hereafter agreed upon in writing.

Provided, however, that no well shall be drilled, derricks, tanks, or buildings erected or located at any place in said river bed, or other work that will obstruct or interfere with the navigation or public use of said Arkansas River.

The lessee further covenants and agrees to exercise diligence in the sinking of wells for oil and gas purposes on the lands covered by this lease, and to drill a sufficient number of wells on said premises to offset each and every well drilled upon the upland within five hundred (500) ft. from the
21 high water mark along the bank on either side of said river adjoining the premises covered by this lease. And the said lessee is hereby required and binds itself to develop said premises as is required by the laws of the State of Oklahoma and the rules and regulations adopted by the Commissioners of the Land Office.

The party of the second part agrees that he will, at all times in the casing of all wells use at least two full joints of ten inch iron casing, and at least 320 ft. of $8\frac{1}{4}$ inch, 24 lb. iron casing, both to extend above high water mark, and at all times employ the best known and approved means to protect the oil and gas sands from the effects of the elements and waters of the river.

The offsetting of all producing wells shall begin within fifteen days from the date of the approval of this lease. All offset wells shall be drilled at no greater distance from the high water mark of said river than the wells on the lands of the upland proprietors. If it be not necessary to drill offset wells on said premises at this time, drilling operations shall nevertheless be begun on said premises within fifteen days from the date of this lease, and whenever any well shall hereafter be drilled within five hundred feet of the high water mark on either side of said river adjoining said premises, and such well shall produce oil and gas in paying quantities then within fifteen days thereafter the lessee herein shall begin the drilling of offset wells as above provided, and development of oil and gas on such land herein shall be sufficient to extract all oil and gas therefrom with the [lease] possible delay.

The said lessee shall operate the leased premises for oil and gas to as full an extent as individual and corporate premises are being operated within the general oil and gas field where such lands are located, and the failure to do so shall forfeit this lease to the State. Accurate and reliable information concerning wells and their operation and management to be furnished on demand of the Commissioners of the Land Office. The said party of the second part further agrees to carry on operations in a workmanlike manner to the fullest possible extent; to commit no avoidable waste on the said land, and to suffer no avoidable waste to be committed upon the portion of its occupancy or use; to take good care of the same, and to promptly surrender and return the premises upon the termination of this lease.

The tools, boilers, power houses, lines, pumping and drilling outfits, tanks, engines, and machinery, and (casing of all dry and exhausted wells) shall remain the property of the party of the second part, and may be removed by them at any time before or at the expiration of this lease.

The casing, derricks, boilers, power houses, power plants, lines, tanks, tubing, rods, pumping and drilling outfits, engines and machinery, tools, and all other appliance necessary to be used in the operation of any producing well on the lease, shall be appraised six months prior to the expiration of this lease contract, in order to ascertain the fair and reasonable value thereof by appraisers, one to be appointed by the Commissioners of the Land Office, and one by the lessee herein named or his assignee holding said lease at the time, and if said appraisers be unable to agree upon the fair and reasonable value of all such property of the lessee or his assigns on said premises the two appraisers so appointed shall have the right and authority to appoint a third person, and the appraisal of a majority of said three appraisers shall be binding upon both parties hereto.

It being expressly understood that the actual sale value of the materials and improvements mentioned at the time of appraisal shall alone be considered and no expense incurred in drilling except materials permanently used in the operation of the well shall be considered as improvements.

In advertising said land for re-lease for a second term of five years, the appraised value of said property of the lessee on the lease shall be stated in said advertisement, and bidder other than the lessee herein named or his assignee, shall be

required to deposit the appraised value thereof with the Commissioner of the Land Office at the time the bid for the second term of five years is made, and if the lessee herein named or his assignee do not succeed in leasing said premises for a second period of five years, then in that event said amount shall be paid over to the lessee herein named, or his assignee, provided, however, that all royalties, rentals, charges and claims have been paid; that it will not permit any nuisance to be maintained on the premises under its control; that it will not use such premises for any other purpose than those authorized in this lease, and that before abandoning any well, it will securely plug the same so as to effectually shut off all water above and below the oil bearing horizon, according to law.

and agree
And the said parties of the second part further covenant [^] that it will keep an accurate account of all oil and gas mining operations showing the sales, prices, dates, or purchase, and the whole amount of oil and gas mined and removed; and all sums due as royalties, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in said prospecting and mining operations and upon all the unsold oil obtained from the land herein leased as security for the payment of said royalty.

And it is mutually understood and agreed that this indenture of lease shall in all respects be subject to the rules and regulations heretofore, or that may hereafter be, lawfully prescribed and not in conflict with the lawful terms of
24 this lease, by said Commissioners relative to oil and gas leases of public lands, and that this lease or any interest therein shall not be sub-let, assigned or transferred without the consent of the Commissioners of the Land Office, first obtained in writing, and it is further mutually understood and agreed that this lease is not executed to or in the interest of any pipe line or transportation company, or any company allied to or confederated therewith, or any subsidiary company thereof, nor any other company, corporation, person or association under the control of either or all of them, nor to any stockholder, officer, director, agent, representative or employee, acting singly or as a firm, or corporations of such companies or either of them, and that should the second parties or their assigns violate any of the covenants, stipulations, or provisions of this lease, or any of the regulations or fail for a period of sixty days to pay the stipulated royalties provided herein, then the Commissioners of the Land Office after ten days notice to the parties hereto shall have the right to avoid this indenture of lease and cancel the same.

If the lessee make reasonable and bonafide efforts to find and produce oil in paying quantity as herein required of them and such effort is unsuccessful, they may at any time thereafter surrender and wholly terminate this lease upon the full payment and performance of all their then accrued and payable obligations hereunder.

It is agreed for any refinery of crude oil and its products and bi-products owned and controlled by the State of Oklahoma, the State shall have the preference right to purchase and receive the output from said premises at the market prices therefore; provided, that the lessee shall sell the said output to any firm, corporation or person whatsoever until notice in writing from the Commissioners of the Land Office has been served upon the lessee that the State of Oklahoma is ready to take such oil or gas or either of them.

25 The lessee's successors or assigns, shall have the preference right to re-lease said premises for a second period of five years at the expiration of this lease, at the maximum rate of rentals, royalties and bonuses that may be obtained therefor at the time of such re-newal; said maximum rate shall be determined by such reasonable and lawful regulations as are now or may hereafter be prescribed by the Commissioners of the Land Office or other person or persons authorized thereto by the State of Oklahoma.

The term "Commissioners of the Land Office of the State" as used in this lease shall include any Board, person, or persons who are or may be hereafter authorized by law to act in behalf of the State in the matters relating to the leasing of the public lands of the State of Oklahoma for oil and gas purposes.

It is further agreed and understood that the approval of this lease by the Commissioners shall be of no force or effect unless the parties of the second furnish a bond in the sum of Four Thousand (\$4,000.00) Dollars to the satisfaction of said commissioners, in accordance with the regulations of said Commissioners prescribed by them, which shall be deposited and remain on file in the office of the Commissioners of the Land Office of the State of Oklahoma.

And it is agreed that the lessee shall, at the expiration of each quarter after the premises produce oil and gas, or either of them, make and file with said Commissioners a production report showing the full amount of the production of oil and gas or either, for the quarter prior to the said report, and

whenever said production reports computed together or singly vary from the sales report, the lessee, upon proper showing and proof shall be given credit on the production report or reports for the amount of shrinkage.

26 That the said Brewer-Elliott Oil & Gas Company shall employ, at its own expense, an Attorney or Attorneys to be hereafter selected and approved by the Board, to assist the Attorney General or the Attorney for the Commissioners of the Land Office of the State of Oklahoma in the prosecution and defense of any and all actions which may arise in connection with said lease, or in connection with the development and operation of oil and gas wells under said lease on said premises; and that said company will pay all court costs and witness fees and all other incidental expenses arising out of any such litigation, and hold the state harmless against any claim for attorney's fees by said attorney or attorneys to be hereafter selected and approved by the Board, or any expenses incurred by them, in connection with any such litigation.

The said lessee binds and obligates itself to do and perform all of the conditions imposed upon it by law and this lease, and obligates itself to protect the State of Oklahoma from all damage, loss, charges, and claims of every kind or nature, by reason of a failure to comply in whole or in part with the terms of this lease and in event that lessee fails, neglect or refuses to comply with the terms of this lease, as herein imposed, the said Commissioners for and on behalf of the State of Oklahoma shall be entitled to recover from the Lessee's bondsmen, all rents, royalties, charges, claims of every kind and nature due and owing and accruing and arising out of and by reason of this lease.

In Witness Whereof, the said parties here hereunto subscribed their signatures on the day and year first above written.

THE COMMISSIONERS OF
THE LAND OFFICE OF THE
STATE OF OKLAHOMA,

(Seal)

By (Signed) Lee Cruce,
Governor of the State of Oklahoma,
and Chairman of said Commissioners.

Attest:

(Signed) Jno. R. Williams,
Secretary to the Commissioners
of the Land Office of the
State of Oklahoma.

**THE BREWER-ELLIOTT OIL
& GAS COMPANY,**

By (Signed) E. C. Johnson,
President.

Attest:

(Signed) O. A Brewer Secretary.

27 State of Oklahoma,
 Oklahoma County—ss.

Before me, Frank B. Lucas, a Notary Public in and for said County and State, on this the 20th day of October, 1913, personally appeared Lee Cruce, to me known to be the person who subscribed the name of the Commissioners of the Land Office of the State of Oklahoma to the foregoing instrument, as its Chairman, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such Commissioners of the Land office for the uses and purposes therein set forth.

In Witness Whereof, I have hereunto set my hand and official seal, on this the 20th day of October, 1913.

(Signed) FRANK B. LUCAS,

(Seal) _____ Notary Public.

My Commission expires Jan. 3, 1915.

State of Oklahoma,
Oklahoma County—ss.

Before me, Frank B. Lucas, a Notary Public in and for said County and State, on this the 15th day of October, 1913, personally appeared E. C. Johnson, to me known to be the person who subscribed the name of the maker to the foregoing instrument, as President, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation for the uses and purposes therein set forth.

In Witness Whereof I have hereunto set my hand and official seal on this the 15th day of October, 1913.

(Signed) **FRANK B. LUCAS,**

(Seal) _____ Notary Public.

My commission expires Jan. 3, 1915.

State of Oklahoma,
Oklahoma County—ss.

I, Jno. R. Williams, Secretary to the Commissioners of the Land Office of the State of Oklahoma, hereby certify that the above and foregoing is a true and correct copy of a certain oil and gas lease made and entered into by and between the Commissioners of the Land Office of the State of Oklahoma and The Brewer-Elliott Oil & Gas Company, as the same appears on file in the office of the Secretary to the Commissioners of the Land Office of the State of Oklahoma.

.....
Secretary to the Commissioners of
the Land Office of the State of Ok-
lahoma.

28

(Exhibit B.)

(Assignment of part of Oil and Gas Mining Lease of
October 14, 1913, by the Brewer-Elliott Oil and
Gas Company to the Pawnee-Osage Oil and Gas
Company, November 3, 1913.)

Know All Men by These Presents:

That the Brewer-Elliott Oil & Gas Company, the within named lessee, for and in consideration of One Dollar, \$1.00) and other valuable considerations to it in hand paid by the Pawnee-Osage Oil & Gas Co., a corporation, at and before the sealing and delivery hereof, the receipt whereof is hereby acknowledged, have granted, assigned, and set over, and by these presents do grant, assign and set over unto the said Pawnee-Osage Oil & Gas Co., a corporation, its successors and assigns, an undivided one-half interest in the within indenture of lease for oil and gas mining purposes, in so far as the same pertains to all that portion of the bed of the Arkansas River below high water mark, except Turkey Island, beginning at a point where the range line between ranges 8 and 9 East cross said River; thence down said river a distance of about one mile to a point where the section line between sections 30 and 31 would cross said stream, all in Township 21 North, Range 9 East, I. M., including all right, title, term of years yet to come, claim and demand whatsoever, of, in, to or use of the same.

To have and to hold said undivided one-half interest in and to said oil and gas mining lease and the appurtenances thereunto belonging, in so far as the same pertains to the land

hereinabove mentioned, unto the said Pawnee-Osage Oil & Gas Co., a corporation, its successors and assigns, for the residue of the term within mentioned, subject to the approval of the Commissioners of the Land Office of the State of Oklahoma.

In Witness Whereof, The Brewer-Elliott Oil & Gas Co., a corporation has caused these presents to be duly signed by its President, and its corporate seal thereto affixed and attested by its Secretary, on this 3rd day of November, A. D., 1913.

THE BREWER-ELLIOTT OIL
& GAS CO.,

(Seal)

29

By E. C. Johnson, President.

Attest:

O. A. Brewer, Secretary.

State of Oklahoma,

Oklahoma County—ss.

Before me, Adelia Tabor Stevens, a Notary Public in and for said County and State, on this the 3rd day of November, A. D., 1913, personally appeared E. C. Johnson, to me known to be the person who subscribed the name of the maker to the foregoing instrument as its President, and acknowledged to me that he executed the same as his free and voluntary act and deed and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

In Witness Whereof, I have hereunto set my hand and official seal this 3rd day of November, A. D., 1913.

(Seal)

ADELIA TABOR STEVENS,
Notary Public

My commission expires 7/24/16.

Certificate.

State of Oklahoma,

Oklahoma County—ss.

I, Jno. R. Williams, the duly appointed, qualified and acting Secretary to the Commissioners of the Land Office of the State of Oklahoma, do hereby certify that the above and foregoing is a full, true and correct copy of Assignment of Oil and Gas lease from the Brewer-Elliott Oil & Gas Company to the Pawnee-Osage Oil & Gas Company, dated 3rd day of No-

vember, 1913, approved by the Commissioners of the Land Office on December 1st, 1913, as shown by the original on file in my office.

It Witness Whereof, I have hereunto set my hand and official seal, on this the 18th day of February, 1914.

.....
Secretary to the Commissioners of the
Land Office of the State of Oklahoma.

30

(Exhibit C.)

(Assignment of part of Oil and Gas Mining Lease of October 14, 1913, by the Brewer-Elliott Oil and Gas Company to the Chickosage Oil and Gas Company, March 25, 1914.)

Know All Men By These Presents:

That the Brewer-Elliott Oil and Gas Company, a corporation, being the lessee from the State for oil and gas purposes on the premises hereinafter described, for and in consideration of Thirty (30%) per cent of the gross production of all oil and gas produced and sold from said land, from which percentage the said Brewer-Elliott Oil & Gas Company above named is to pay to the State the royalty of 12½% of the gross production as provided in its lease, and as a further consideration the said Chickosage Oil & Gas Company, a corporation, agrees to pay to the said The Brewer-Elliott Oil and Gas Company for the use and benefit of the State of Oklahoma, as a bonus the first Five Hundred Fifty (550) barrels of oil produced from each well as provided in its lease contract from the State, have granted, assigned, transferred and set over and by these presents do grant, assign, transfer and set over unto the Chickosage Oil & Gas Company, a corporation, its successors and assigns, all its right, title and interest in and to all that portion of the bed of the Arkansas River below high water mark, excepting Turkey Island, beginning at a point where the section line between sections twenty-five (25) and twenty-six (26) Township twenty-one (21) North, Range eight (8) East, if projected, would cross said river; thence down said stream to the point where the range line between ranges eight (8) and nine (9) east, if projected would cross said stream, between sections twenty-five (25) Township twenty-one (21) North, Range eight (8) East, and section thirty (30) Township twenty-one (21) North, Range nine (9) East, of the Indian Meridian, in Oklahoma, (Osage

County lying on the North, of said stream and Pawnee County on the south thereof), including all the right, title, term of years yet to come, claim and demand whatsoever of The Brewer-Elliott Oil & Gas Company, lessee from the State of Oklahoma, in, to, or use of the same, in so far as the same pertains to the land hereinabove described, being a portion of the land and river bed described in its lease from the State of Oklahoma, dated the 14th day of October, 1913.

Party of the second part shall furnish all material, drilling rigs, pumps, boilers, pipe lines, casing and other material necessary for the drilling and operation of all oil and gas wells on said land, and all said improvements shall be and remain the property of the parties of the second part.

This assignment is made subject to the express condition that in the operation, drilling and development of said lands that the party of the second part shall comply with all the provisions and conditions of said contract between the said first party and the Commissioners of the Land Office of the State of Oklahoma, a copy of which is hereto attached, referred to and made a part hereof the same as if set out herein in full, and the further condition that any renewal of the said contract with said Commissioners shall be by the said party of the first part for the mutual benefit of both of said parties in the same ratio of interest as provided in this assignment.

This assignment is given subject to the approval of the Commissioners of the Land Office of the State of Oklahoma.

Said second party agrees to furnish to the State of Oklahoma a good and sufficient bond in the sum of Two Thousand Dollars (\$2000.00) to the satisfaction of the Commissioners of the School Land Department, conditioned upon the faithful performance of the requirements and stipulations of a certain oil and gas lease, executed on the 14th day of October, 1913, from the Commissioners of the Land Office of the State of Oklahoma, to the Brewer-Elliott Oil and Gas Company, a corporation, a true copy of which is hereto attached to this contract, marked "Exhibit A", and made a part of this assignment just the same as if the terms and conditions were set out in full herein.

32 In the event that the party of the second part fails or refuses to comply with any of the terms of this assignment, then in that event it shall forfeit to the party of the first part any and all rights it shall have under this contract and assignment of lease, together with all materials and

equipment, drilling rigs, pumps, tanks, boilers, pipe lines and casing.

Executed and delivered in duplicate this the 25th day of March, A. D., 1914.

(Seal)

(Signed) CHICKOSAGE OIL AND
GAS COMPANY,

By H. L. Muldrow, President.

Attest:

Roy E. Burks, Secretary.

(Seal)

THE BREWER-ELLIOTT
OIL AND GAS
COMPANY,

By B. E. C. Johnson, President.

Attest:

O. M. Brewer, Secretary.

State of Oklahoma,

Oklahoma County—ss.

Before me, Adelia Tabor Stevens, a Notary Public in and for said County and State above named on this the 25th day of March, A. D. 1914, personally appeared H. L. Muldrow, to me known to be the identical person who signed the name of the Chickosage Oil and Gas Company, a corporation, to the above and foregoing instrument, as its President, and acknowledged to me that he executed the same, as his free and voluntary act and deed, and the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

Witness my hand and official seal the day and year last above written.

(Seal)

ADELIA TABOR STEVENS,
Notary Public.

My commission expires 7/24/16.

State of Oklahoma,

Oklahoma County—ss.

Before me, Adelia Tabor Stevens, a Notary Public in and for said County and State above named, on this the 25th day of March, A. D., 1914, personally appeared E. C. Johnson, to me known, to be the identical person who signed the name of The Brewer-Elliott Oil and Gas Company, a corporation, to the above and foregoing instrument as its President, and acknowledged to me that he executed the same as his free and

voluntary act and deed and the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

Witness my hand and official seal the day and year last above written.

(Seal)

ADELIA TABOR STEVENS,
Notary Public.

My commission expires 7/24/16.

33

Exhibit "D".

State of Oklahoma

Oil and Gas Mining Lease.

This Indenture Of Lease, made and entered into in duplicate on this the 1st day of October, 1913, by and between the Commissioners of the Land Office of the State of Oklahoma, hereinafter styled the Lessors, parties of the first part, and the Number One Oil Company, a corporation, hereinafter styled the Lessee, party of the second part;

Witnesseth: That under and in pursuance of the constitution and laws of the State of Oklahoma, the said lessors, for and in consideration of the bonus, royalty, covenants and stipulations and conditions herein expressed and hereby agreed to be paid, observed and performed by the said lessees, their successors and assigns, do hereby lease and let unto the said lessee and its successors and assigns for a term of five (5) years from and after the date hereof, all oil deposits and natural gas in or under the following described tract of land lying in Osage and Pawnee Counties, in the State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River below high water mark in Sections One (1) and Twelve (12), and 13, Township Twenty-One (21) North, Range Seven (7) East, I. M.,

Which said lands are public lands belonging to the State and were by the said Commissioners of the Land Office declared to be valuable for oil and gas purposes, and the said oil and gas deposits therein contained were by the said Commissioners of the Land Office segregated from the surface use and interest therein, with the right to prospect for, extract, pipe, store, refine, and remove such oil and natural gas, with the right to use and keep so much of the surface of said prem-

ises as may be necessary to prospect for, extract, pipe, store, refine and remove such oil and natural gas; including still further the right to use a sufficient amount of such oil
34 and natural gas as fuel, light and power so far as may be necessary to the prosecution of said operation, and with the further right to use any water on said premises that may be necessary to carry on said operation, in consideration whereof the said Lessee hereby agrees to pay a royalty of One-Eighth of all oil and gas produced and sold from said premises, and the further consideration of a bonus of Twenty-five (25) per cent of the remaining seven-eighths of all oil and gas produced from the wells that may be drilled on said lease when the average production from all the operated producing wells on said lease is above Sixty (60) barrels of oil per day or three million cubic feet of gas per day from each well for every successive period of sixty days of active operation of said wells.

An accurate and complete record of the daily production of the wells drilled on said lease shall be kept, and in the event that the average production of oil and gas shall fall below the above specified 60 bbls. of oil and 3,000,000 ft. of gas per day for any period of 60 days as above set out, the lessee shall file a detailed statement with the Commissioners of the Land Office, showing the number of days and the hours per day that each well has been operated; and at all times the said lessee shall be required to operate the said wells to the full capacity and to cause them to produce the greatest amount of oil that can be obtained therefrom; and should any well or wells be not continuously operated during any such period of 60 days or any portion thereof, a full, true and complete statement shall be made under oath showing the days and hours per day each well has not been operated.

All oil and gas due to the State under this contract shall be delivered by the lessee herein or its assigns free of cost to the State into pipe lines, tanks, or cars, or settled for, before removing the same from the premises if sold in any
35 other way. Certified copies of guage tickets, sales and shipments to be furnished at the request of the Commissioners or anyone authorized to act for them; gas to be metered on the premises under high pressure unless some other method of guaging and measuring same shall be hereafter agreed upon in writing.

Provided however that no well shall be drilled, derricks, tanks or buildings erected or located at any place in said

river bed, or other work that will obstruct or interfere with the navigation or public use of said Arkansas River.

The Lessee further covenants and agrees to exercise diligence in the sinking of wells for oil and gas purposes on the lands covered by this lease, and to drill a sufficient number of wells on said premises to offset each and every well drilled upon the upland within Five Hundred (500) feet from the high water mark along the bank on either side of said river adjoining the premises covered by this lease. And the said lessee is hereby required and binds itself to develop said premises as is required by the laws of the State of Oklahoma and the rules and regulations adopted by the Commissioners of the Land Office.

The party of the second part agrees that he will, at all times in the casing of all wells use at least two full joints of ten inch iron casing, and at least 320 ft. of 8¼ inch, 24lb. iron casing both to extend above high water mark, and at all times employ the best known and approved means to protect the oil and gas sands from the effects of the elements and waters of the river.

The offsetting of all producing wells shall begin within fifteen days from the date of the approval of this lease. All offset wells shall be drilled at no greater distance from the high water mark of said river than the wells on the lands of the upland proprietors. If it be not necessary to drill offset wells on said premises at this time drilling operations shall nevertheless be begun on said premises within three
36 months from the date of this lease, and whenever any well shall hereafter be drilled within five hundred feet of the high water mark on either side of said river adjoining said premises and such well shall produce oil and gas in paying quantities, then within fifteen days thereafter the lessee herein shall begin the drilling of offset wells as above provided, and development of oil and gas on such land herein shall be sufficient to extract all oil and gas therefrom with the least possible delay.

The said lessee shall operate the leased premises for oil and gas to as full an extent as individual and corporate premises are being operated within the general oil and gas field where such lands are located, and the failure to do so shall forfeit this lease to the State. Accurate and reliable information concerning wells and their operations and management to be furnished on demand of the Commissioners of the Land Office. The said party of the second part further agrees to carry on operations in a workmanlike manner to the fullest possible

extent, to commit no avoidable waste on said land, and to suffer no avoidable waste to be committed upon the portion of its occupancy or use; to take good care of the same, and to promptly surrender and return the premises upon the termination of this lease.

The tools, boilers, power houses, lines, pumping and drilling outfits, tanks, engines and machinery, (and casing of all dry and exhausted wells) shall remain the property of the party of the second part, and may be removed by them at any time before or at the expiration of this lease.

The casing, derricks, boilers, power houses, power plants, lines, tanks, tubing, rods, pumping and drilling outfits, engines and machinery, tools, and all other appliances necessary to be used in the operation of any producing well on the lease, shall be appraised six months prior to the expiration of
37 this lease, contract, in order to ascertain the fair and reasonable value thereof by appraisers, one to be appointed by the Commissioners of the Land Office, and one by the lessee herein named or his assignee holding said lease at the time, and if said appraisers be unable to agree upon the fair and reasonable value of all such property of the lessee or his assigns on said premises, the two appraisers so appointed shall have the right and authority to appoint a third person, and the appraisement of a majority of said three appraisers shall be binding upon both parties hereto.

It being expressly understood that the actual sale value of the materials and improvements mentioned at the time of appraisement shall alone be considered and no expense incurred in drilling except materials permanently used in the operation of the well shall be considered as improvements.

In advertising said land for re-lease for a second term of five years, the appraised value of said property of the lessee on the lease shall be stated in said advertisement, and any bidder other than the lessee herein named or his assignee shall be required to deposit the appraised value thereof with the Commissioners of the Land Office at the time the bid for the second term of five years is made, and if the lessee herein named or his assignee do not succeed in leasing said premises for a second period of five years then in that event said amount shall be paid over to the lessee herein named, or his assignee, provided however, that all royalties, rentals, charges and claims have been paid; that it will not permit any nuisance to be maintained on the premises under it's control, that

it will not use such premises for any other purpose than those authorized in this lease, and that before abandoning any well, it will securely plug the same so as to effectually shut off all water above and below the oil bearing horizon, according to law.

38 And the said parties of the second part further covenant and agree that it will keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, or purchase, and the whole amount of oil and gas mined and removed; and all sums due as royalties shall be a lien on all implements, tools, movable machinery, and all other person chattels used in said prospecting and mining operations and upon all the unsold oil obtained from the land herein leased as security for the payment of said royalty.

And it is mutually understood and agreed that this indenture of lease shall in all respects be subject to the rules and regulations heretofore, or that may hereafter be lawfully prescribed and not in conflict with the lawful terms of this lease, by said Commissioners relative to oil and gas leases of public lands, and that this lease or any interest therein shall not be sub-let, assigned or transferred without the consent of the Commissioners of the Land Office first obtained in writing, and it is further mutually understood and agreed that this lease is not executed to or in the interest of any pipe line or transportation company or any company allied to or confederated there-

erated with or any subsidiary company thereof, nor any other company, corporation, person or association under the control of either or all of them, nor to any stockholder, officer, director, agent representative or employee, acting singly or as a firm, or corporations of such companies or either of them, and that should the second parties or their assigns violate any of the covenants, stipulations or provisions of this lease, or any of the regulations or fail for a period of sixty days to pay the stipulated royalties provided herein, then the Commissioners after ten days notice to the parties hereto shall have the right to avoid this indenture of lease and cancel the same.

39 If the lessee make reasonable and bonafide efforts to find and produce oil in paying quantity as herein required of them and such effort is unsuccessful, they may at any time thereafter surrender and wholly terminate this lease upon the full payment and performance of all their then accrued and payable obligations hereunder.

It is agreed for any refinery or crude oil and its products and bi-products owned and controlled by the State of Oklahoma, the State shall have the preference right to purchase and receive the output from said premises at the market prices therefore; providing that the lessees shall sell the said output to any firm, corporation, or person whatsoever until notice in writing from the Commissioners of the Land Office has been served upon the lessee that the State of Oklahoma is ready to take such oil and gas or either of them.

The lessee's successors, or assigns, shall have the preference right to re-lease said premises for a second term of five years at the expiration of this lease, at the maximum rate of rentals, royalties and bonuses that may be obtained therefor at the time of such renewal; said maximum rate shall be determined by such reasonable and lawful regulations as are now or may hereafter be prescribed by the Commissioners of the Land Office or other person or persons authorized there-to by the State of Oklahoma.

The term "Commissioners of the Land Office of the State" as used in this lease shall include any Board, person, or persons who are or may be hereafter authorized by law to act in behalf of the State in the matters relating to the leasing of the public lands of the State of Oklahoma for oil and gas purposes.

It is further agreed and understood that the approval of this lease by the Commissioners shall be of no force nor
40 effect unless the parties of the second part furnish a bond in the sum of Two Thousand (\$2,000.00) Dollars to the satisfaction of said Commissioners, and in accordance with the regulations of said Commissioners prescribed by them, which shall be deposited and remain on file in the office of the Commissioners of the Land Office of Oklahoma.

And it is agreed that the lessee shall, at the expiration of each quarter after the premises produce oil and gas, or either of them, make and file with said Commissioners a production report showing the full amount of the production of oil and gas or either, for the quarter prior to the said report, and whenever said production reports computed together or singly vary from the sales report, the lessee, upon proper showing and proof shall be given credit on the production report or reports for the amount of shrinkage.

The said lessee binds and obligates itself to do and perform all of the conditions imposed upon it by law and this lease, and obligates itself to protect the State of Oklahoma

from all damages, loss charges and claims of every kind or nature, by reason of a failure to comply in whole or in part with the terms of this lease and in event that lessee fails, neglects or refuses to comply with the terms of this lease as herein imposed, and in the event of its failure to secure from Charles Page of Tulsa, Oklahoma, a waiver of all his rights, title and interest in and to the river herein described as riparian owner, to be filed with the Commissioners of the Land Office within thirty days, this lease and all rights, and privileges inuring to the benefit of the said lessee may be forfeited and cancelled; and the said Commissioners for and on behalf of the State of Oklahoma, shall be entitled to recover from the lessee's bondsmen, all rents, royalties, charges, claims of every kind and nature due and owing and accruing and arising out of and by reason of this lease.

In Witness Whereof, the said parties have hereunto subscribed their signatures of the day and year first above written.

41

THE COMMISSIONERS OF
THE LAND OFFICE OF THE
STATE OF OKLAHOMA,

(Seal)

By (Signed) Lee Cruce,
Governor of the State of Oklahoma, and
Chairman of the said Commissioners.

Attest:

(Signed) Jno. R. Williams,
Secretary to the Commissioners of the
Land Office of the State of Oklahoma.

(Seal)

NUMBER ONE OIL COMPANY
By (Signed) C. N. Haskell,
President.

Attest:

(Signed) Jos. Haskell, Secretary.

State of Oklahoma,
Tulsa County—ss.

Before me, Loretta O'Rourke, a Notary Public in and for said County and State, on this 1st day of October, 1912, personally appeared C. N. Haskell to me known to be the person who subscribed the name of the maker to the foregoing instrument, as President, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the

free and voluntary act and deed of such corporation for the uses and purposes therein set forth.

In Witness Whereof, I have hereunto set my hand and official seal, on this the 1st day of October, 1913.

(Seal) (Signed) LORETTO O'ROURKE,
Notary Public.

My commission expires April 29th, 1917.

State of Oklahoma,
Oklahoma County—ss.

Before me, Frank B. Lucas, a Notary Public within and for the said County and State, on this the 1st day of October, 1913, personally appeared Lee Cruce, to me known to be the person who subscribed the name of the Commissioners of the Land Office of the State of Oklahoma to the foregoing instrument, as its Chairman, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such Commissioners of the Land Office, for the uses and purposes therein set forth.

42

In Witness Whereof, I have hereunto set my hand and official seal, on this the 1st day of October, 1913.

(Seal) (Signed) FRANK B. LUCAS,
Notary Public.

My commission expires January 3, 1915.

State of Oklahoma,
Oklahoma County—ss.

I, Jno. R. Williams, Secretary to the Commissioners of the Land Office of the State of Oklahoma, hereby certify that the above and foregoing is a true and correct copy of the Oil and Gas Lease given by the Number One Oil Company to the Commissioners of the Land Office as the same appears on file in the office of said Commissioners.

Witness my hand this 29th day of November, 1912.

.....

Exhibit "E".

Contract.

This Agreement, executed this 31st day of October, A. D., 1913, by and between Number One Oil Company, a corporation of the State of Oklahoma, first party, and the Arkansas River Bed Oil & Gas Company, a corporation of the State of Oklahoma, second party, witnesseth:

That, Whereas, The First Party is owner of oil and gas mining leases upon the following described tracts of land, all situate in the State of Oklahoma, as follows, to-wit:

Tract No. 1.—All that portion of the bed of the Arkansas River below high water mark in Sections One (1), Twelve (12), and Thirteen (13), Township Twenty-one (21), North Range Seven (7) East, on the line between Pawnee and Osage Counties, Oklahoma, being about two miles in length.

Tract No. 2.—The South half of the Northeast quarter of Section Twenty Five (25) Township Twenty (20) North, Range Twelve (12) East, Tulsa County, Oklahoma, containing (80) acres of land. This lease is a straight one-eight ($1/8$) royalty lease. A cash bonus of Ten Dollars (\$10.00) an acre having been paid, the lease is assigned with the burden of Fifteen Dollars (\$15.00) per acre to be paid from oil produced upon these premises, and to be paid only in case oil is produced thereon in paying quantities, and for the purpose of this contract said oil bonus would be charged against both the first and second party the same as an item of cost of drilling wells and producing oil.

Tract No. 3.—Being One Hundred and Seventy (170) acres in Township Twenty-five (25) North, Range Sixteen (16) East, Nowata County, Oklahoma, being the East half of the Northeast quarter of Section Seven (7), containing Eighty (80) acres; also the Northwest quarter of the Southwest quarter, and the Southwest quarter of the Northwest quarter, and the Southwest quarter of the Northwest quarter of 44 the Northwest quarter of Section Eight (8); these three last named tracts containing Ninety (90) acres; all in Township and Range aforesaid. These leases are a straight one-eight ($1/8$) royalty and have the additional burden of a carried interest for the original lessees (W. B. and Gertrude Thraves) of one-third ($1/3$). It is expressly stipulated that the said carried interest shall be charged against the interest of the first party herein; and

Whereas, The second party does hereby agree to develop said property for oil and gas mining purposes in accordance with the terms and provisions of the said leases now owned by the first party;

Now, Therefore, Said first party, for and in consideration of the covenants and agreements herein set forth, does hereby sell, assign, transfer and convey unto said second party, its successors or assigns, all of the rights of the first party and its title and interest in said leases and every part thereof, and that the said leases and assignments thereof shall be deposited in the Exchange National Bank of Tulsa, Oklahoma, in pursuance of the conditions of this contract and shall be delivered to the second party when the second party has Fifteen Thousand Dollars (\$15,000.00) in cash deposited in said Exchange National Bank for the express purpose of drilling two wells on Tract Number One, one well on Tract Number Two and one well on Tract Number Three, and that said funds so deposited for said sepecific purpose shall be drawn by the order of the proper officer of the said second party upon bills concurred in by the managing officer of the party of the first part; and provided further, that not less than one-third (1/3) of said money shall be on deposit within fifteen (15) days from this date, and that the drilling of one well on Tract Number One shall begin within fifteen (15) days from this date, and the drilling of the wells on Tracts Number Two and Three begin within Forty (40) days from this date; and with these provisions the deposit of this contract and said lease assignments is made, and with the right reserved to the first party to withdraw this contract and said lease assignments in case default is made by the second party in the deposit of money within the times above stipulated.

In consideration of which said second party agrees to comply with the terms and provisions of said leases and carry said party of the first part for four-tenths (4/10) interest in the net profits arising from the operation or sale of said property and the oil and gas produced thereon, and all such operations for oil and gas on said leased premises shall be financed through the application of said Fifteen Thousand Dollars (\$15,000.00) aforesaid until said Fifteen Thousand Dollars (\$15,000.00) shall be so expended, and future development of said premises shall be provided for out of the sale of oil or gas produced on said premises or by a proportionate contribution of working capital, four-tenth (4/10) by the party of the first part and six-tenth (6/10) by the party of

the second part, provided, as above stated, that the said interest of W. B. and Gertrude Thraves in the production from Tract Number Three shall be charged against the interest of the first party herein; and provided further that the first investment of Fifteen Thousand Dollars (\$15,000.00) by the second party shall not be a charge upon the production or income from said property.

In Witness Whereof, said parties have caused this contract to be executed by their duly authorized officers on the day and year first above written.

(Seal)

NUMBER ONE OIL COMPANY,

Attest:

By C. N. Haskell, President.

Joe Kaskell,
Secretary.

(Seal)

ARKANSAS RIVER BED OIL &
GAS CO.

Attest:

By A. W. Brown, President.

Bryan Blake,
Secretary.

46 State of Oklahoma,
County of Tulsa—ss.

Before me, the undersigned, a Notary Public within said County and State aforesaid, on this 6th day of February, 1914, personally appeared C. N. Haskell, to me known to be the identical person who executed the within and foregoing instrument, and acknowledged to me that he executed the same as President of Number One Oil Company, a corporation, as the free and voluntary act and deed of said corporation, and as his free and voluntary act and deed, for the uses and purposes therein set forth.

Witness my hand and official seal the day and date last above written.

(Seal)

PAUL KONZ,
Notary Public.

My commission expires Jan. 21, 1917.

47

Exhibit "F".

State of Oklahoma

Oil and Gas Mining Lease

This Indenture of Lease, made and entered into in duplicate on this the 1st day of October, 1913, by and between the Com-

missioners of the Land Office of the State of Oklahoma, hereinafter styled the Lessors, parties of the first part, and the Number One Oil Company, a corporation, hereinafter styled the Lessee, party of the second part:

Witnesseth: That under and in pursuance of the constitution and laws of the State of Oklahoma, the said lessors, for and in consideration of the bonus, royalty, covenants and stipulations and conditions herein expressed and hereby agreed to be paid, observed and performed by the said lessees, their successors and assigns, do hereby lease and let unto the said lessee and its successors and assigns for a term of five (5) years from and after the date hereof, all oil deposits and natural gas in or under the following described tract of land lying in Osage and Pawnee Counties, in the State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River below high water mark in Sections Six (6) and Seven (7), Township Twenty-one (21) North, Range Eight (8) East, T. M.,

Which said lands are public lands belonging to the State and were by the said Commissioners of the Land Office declared to be valuable for oil and gas purposes, and the said oil and gas deposits therein contained were by the said Commissioners of the Land Office segregated from the surface use and interest therein, with the right to prospect for, extract, pipe, store, refine, and remove such oil and natural gas, with the right to use and keep so much of the surface of said premises as may be necessary to prospect for, extract, pipe, store, refine and remove such oil and natural gas; including still further the right to use a sufficient amount of such oil
48 and natural gas as fuel, light and power so far as may be necessary to the prosecution of said operation, and with the further right to use any water on said premises that may be necessary to carry on said operation, in consideration whereof the said Lessee hereby agrees to pay a royalty of One-Eighth of all oil and gas produced and sold from said premises, and the further consideration of a bonus of Twenty-five (25) per cent of the remaining seven-eighths of all oil and gas produced from the wells that may be drilled on said lease when the average production from all the operated producing wells on said lease is above Sixty (60) barrels of oil per day or three million cubic feet of gas per day from each well for every successive period of sixty days of active operation of said wells.

An accurate and complete record of the daily production of the wells drilled on said lease shall be kept, and in the event that the average production of oil and gas shall fall below the above specified 60 bbls. of oil and 3,000,000 ft. of gas per day for any period of 60 days as above set out, the lessee shall file a detailed statement with the Commissioners of the Land Office, showing the number of days and the hours per day that each well has been operated; and at all times the said lessee shall be required to operate the said wells to the full capacity and to cause them to produce the greatest amount of oil that can be obtained therefrom; and should any well or wells be not continuously operated during any such period of 60 days or any portion thereof, a full, true and complete statement shall be made under oath showing the days and hours per day each well has not been operated.

All oil and gas due to the State under this contract shall be delivered by the lessee herein or its assigns free of cost to the State into pipe lines, tanks, or cars, or settled for, before removing the same from the premises if sold in any other way, certified copies of gauge tickets, sales and shipments to be furnished at the request of the Commissioners or anyone authorized to act for them; gas to be metered on the premises under high pressure unless some other method of gauging and measuring same shall be hereafter agreed upon in writing.

Provided however that no well shall be drilled, derricks, tanks or buildings erected or located at any place in said river bed, or other work that will obstruct or interfere with the navigation or public use of said Arkansas River.

The Lessee further covenants and agrees to exercise diligence in the sinking of wells for oil and gas purposes on the lands covered by this lease, and to drill a sufficient number of wells on said premises to offset each and every well drilled upon the upland within Five Hundred (500) feet from the along the bank

high water mark / on either side of said river adjoining the premises covered by this lease. And the said lessee is hereby required and binds itself to develop said premises as is required by the laws of the State of Oklahoma and the rules and regulations adopted by the Commissioners of the Land Office.

The party of the second part agrees that he will, at all times in the casing of all wells use at least two full joints of ten inch iron casing, and at least 320 ft. of 8¼ inch, 24lb. iron

casing both to extend above high water mark, and at all times employ the best known and approved means to protect the oil and gas sands from the effect of the elements and waters of the river.

The offsetting of all producing wells shall begin within fifteen days from the date of the approval of this lease. All offset wells shall be drilled at no greater distance from the high water mark of said river than the wells on the lands of the upland proprietors. If it be not necessary to drill offset wells on said premises at this time drilling operations shall nevertheless be begun on said premises within three
50 months from the date of this lease, and whenever any well shall hereafter be drilled within five hundred feet of the high water mark on either side of said river adjoining said premises and such well shall produce oil and gas in paying quantities, then within fifteen days thereafter the lessee herein shall begin the drilling of offset wells as above provided, and development of oil and gas on such land herein shall be sufficient to extract all oil and gas therefrom with the least possible delay.

The said lessee shall operate the leased premises for oil and gas to as full an extent as individual and corporate premises are being operated within the general oil and gas field where such lands are located, and the failure to do so shall forfeit this lease to the State. Accurate and reliable information concerning wells and their operations and management to be furnished on demand of the Commissioners of the Land Office. The said party of the second part further agrees to carry on operations in a workmanlike manner to the fullest possible extent, to commit no avoidable waste on said land, and to suffer no avoidable waste to be committed upon the portion of its occupancy or use; to take good care of the same, and to promptly surrender and return the premises upon the termination of this lease.

The tools, boilers, power houses, lines, pumping and drilling outfits, tanks, engines and machinery (and casing of all dry and exhausted wells) shall remain the property of the party of the second part, and may be removed by them at any time before or at the expiration of this lease.

The casing, derricks, boilers, power houses, power plants, lines, tanks, tubing, rods, pumping and drilling outfits, engines and machinery, tools, and all other appliances necessary

to be used in the operation of any producing well on the lease, shall be appraised six months prior to the expiration
51 of this lease, contract, in order to ascertain the fair and reasonable value thereof by appraisers, one to be appointed by the Commissioners of the Land Office, and one by the lessee herein named or his assignee holding said lease at the time, and if said appraisers be unable to agree upon the fair and reasonable value of all such property of the lessee or his assigns on said premises, the two appraisers so appointed shall have the right and authority to appoint a third person, and the appraisal of a majority of said three appraisers shall be binding upon both parties hereto.

It being expressly understood that the actual sale value of the materials and improvements mentioned at the time of appraisal shall alone be considered and no expense incurred in drilling except materials permanently used in the operation of the well shall be considered as improvements.

In advertising said land for re-lease for a second term of five years, the appraised value of said property of the lessee on the lease shall be stated in said advertisement, and any bidder other than the lessee herein named or his assignee shall be required to deposit the appraised value thereof with the Commissioners of the Land Office at the time the bid for the second term of five years is made, and if the lessee herein named or his assignee do not succeed in leasing said premises for a second period of five years then in that event said amount shall be paid over to the lessee herein named, or his assignee, provided however, that all royalties, rentals, charges and claims have been paid; that it will not permit any nuisance to be maintained on the premises under its control, that it will not use such premises for any other purpose than those authorized in this lease, and that before abandoning any well, it will securely plug the same so as to effectually shut off all water above and below the oil bearing horizon, according to law.

52 And the said parties of the second part further covenant and agree that it will keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, or purchase, and the whole amount of oil and gas mined and removed; and all sums due as royalties shall be a lien on all implements, tools, movable machinery, and all other person chattels used in said prospecting and mining operations and upon all the unsold oil obtained from the land herein leased as security for the payment of said royalty.

And it is mutually understood and agreed that this indenture of lease shall in all respects be subject to the rules and regulations heretofore, or that may hereafter be lawfully prescribed and not in conflict with the lawful terms of this lease, by said Commissioners relative to oil and gas leases of public lands, and that this lease or any interest therein shall not be sub-let, assigned or transferred without the consent of the Commissioners of the Land Office first obtained in writing, and it is further mutually understood and agreed that this lease is not executed to or in the interest of any pipe line or transportation company or any company allied to or confederated therewith or any subsidiary company thereof, nor any other company, corporation, person or association under the control of either or all of them, nor to any stockholder, officer, director, agent, representative or employee, acting singly or as a firm, or corporation of such companies or either of them, and that should the second parties or their assigns violate any of the covenants, stipulations or provisions of this lease, or any of the regulations or fail for a period of sixty days to pay the stipulated royalties provided herein, then the Commissioners after ten days notice to the parties hereto shall have the right to avoid this indenture of lease and cancel the same.

53 If the lessee make reasonable and bonafide efforts to find and produce oil in paying quantity as herein required of them and such effort is unsuccessful, they may at any time thereafter surrender and wholly terminate this lease upon the full payment and performance of all their then accrued and payable obligations hereunder.

It is agreed for any refinery or crude oil and its products and bi-products owned and controlled by the State of Oklahoma, the State shall have the preference right to purchase and receive the output from said premises at the market price therefore; providing that the lessee shall sell the said output to any firm, corporation, or person whatsoever until notice in writing from the Commissioners of the Land Office has been served upon the lessee that the State of Oklahoma is ready to take such oil and gas or either of them.

The lessee's successors, or assigns, shall have the preference right to re-lease said premises for a second term of five years at the expiration of this lease, at the maximum rate of rentals, royalties and bonuses that may be obtained therefor at the time of such renewal; said maximum rate shall be determined by such reasonable and lawful regulations as are now or may hereafter be prescribed by the Commissioners of

the Land Office or other person or persons authorized thereto by the State of Oklahoma.

The term "Commissioners of the Land Office of the State" as used in this lease shall include any Board, person, or persons who are or may be hereafter authorized by law to act in behalf of the State in the matters relating to the leasing of the public lands of the State of Oklahoma for oil and gas purposes.

It is further agreed and understood that the approval of this lease by the Commissioners shall be of no force nor
54 effect unless the parties of the second part furnish a bond in the sum of Two Thousand (\$2,000.00) Dollars to the satisfaction of said Commissioners, and in accordance with the regulations of said Commissioners prescribed by them, which shall be deposited and remain on file in the office of the Commissioners of the Land Office of Oklahoma.

And it is agreed that the lessee shall, at the expiration of each quarter after the premises produce oil and gas, or either of them, make and file with said Commissioners a production report showing the full amount of the production of oil and gas or either, for the quarter prior to the said report, and whenever said production reports computed together or singly vary from the sales report, the lessee, upon proper showing and proof shall be given credit on the production report or reports for the amount of shrinkage.

The said lessee binds and obligates itself to do and perform all of the conditions imposed upon it by law and this lease, and obligates itself to protect the State of Oklahoma from all damage, loss charges and claims of every kind or nature, by reason of a failure to comply in whole or in part with the terms of this lease and in event that lessee fails, neglects or refuses to comply with the terms of this lease as herein imposed, and in the event of its failure to secure from Charles Page of Tulsa, Oklahoma, a waiver of all his rights, title and interest in and to the river herein described as riparian owner, to be filed with the Commissioners of the Land Office within thirty days, this lease and all rights, and privileges inuring to the benefit of the said lessee may be forfeited and cancelled; and the said Commissioners for and on behalf of the State of Oklahoma, shall be entitled to recover from the lessee's bondsmen, all rents, royalties, charges, claims of every kind and nature due and owing and accruing and arising out of and by reason of this lease.

In Witness Whereof, the said parties have hereunto subscribed their signatures of the day and year first above written.

55 (Seal) THE COMMISSIONERS OF THE LAND
OFFICE OF THE STATE OF
OKLAHOMA,
By Lee Cruce,
Governor of the State of Oklahoma, and
Chairman of the said Commissioners.

Attest:

Jno. R. Williams,
Secretary to the Commissioners of the
Land Office of the State of Oklahoma.

(Seal) NUMBER ONE OIL COMPANY,
By C. N. Haskell, President.

Attest:

Jos. Haskell, Secretary.

State of Oklahoma,
Tulsa County—ss.

Before me, Loretta O'Rourke, a Notary Public in and for said County and State, on this 1st day of October, 1913, personally appeared C. N. Haskell to me known to be the person who subscribed the name of the maker to the foregoing instrument, as President, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation for the uses and purposes therein set forth.

In Witness Whereof, I have hereunto set my hand and official seal, on this the 1st day of October, 1913.

(Seal) LORETTA O'ROURKE,
Notary Public.

My commission expires April 29th, 1917.

State of Oklahoma,
Oklahoma County—ss.

Before me, Frank B. Lucas, a Notary Public within and for the said County and State, on this the 1st day of October, 1913, personally appeared Lee Cruce, to me known to be the person who subscribed the name of the Commissioners of the Land Office of the State of Oklahoma to the foregoing instrument, as its Chairman, and acknowledged to me that he executed the same as his free and voluntary act and deed, and

as the free and voluntary act and deed of such Commissioners
of the Land Office, for the uses and purposes therein
56 set forth.

In Witness Whereof, I have hereunto set my hand and official seal, on this the 1st day of October, 1913.

(Seal)

(Signed) **FRANK B. LUCAS,**
Notary Public.

My commission expires January 3, 1915.

State of Oklahoma,
Oklahoma County—ss.

I, Jno. R. Williams, the duly appointed, qualified and acting Secretary to the Commissioners of the Land Office of the State of Oklahoma, do hereby certify that the above and foregoing is a full, true and correct copy of oil and gas mining lease between the Commissioners of the Land Office of the State of Oklahoma, and the Number One Oil Company, a corporation, dated 1st day of October, 1913, as shown by the original of said lease on file in my office.

Witness My Hand and official seal, on this the 9th day of
March, 1914.

Secretary to the Commissioners of the
Land Office of the State of Oklahoma.

57

(Exhibit G.)

(Assignment of Lease by Number One Oil Company
to the Scioto Oil Company, November 10, 1913.)

This Agreement, executed this 10th day of November, A. D., 1913, by and between Number One Oil Company, a corporation of Muskogee, Okla., party of the first part, and The Scioto Oil Co., a corporation of Tulsa, Oklahoma, party of the second part:

Witnesseth: That said party of the first part, for and in consideration of the sum of One Dollar and other good and valuable consideration, the receipt of which is hereby acknowledged, does hereby sell, convey, assign and transfer and set over unto said party of the second part, its successors and assigns, all the right, title and interest of said party of the first part in and to the oil and gas mining lease and leasehold estate thereby created, upon the following described property situated between the Counties of Osage and Tulsa and State of Oklahoma, to-wit:

All that portion of the bed of the Arkansas River below high water mark in Sections Six (6), and Seven (7), Township Twenty-one (21) North, Range Eight (8) East; said lease being executed October 1st, 1913, by the Commissioners of the Land Office of the State of Oklahoma, as lessors, to the above named assignor herein, as lessee.

To Have And To Hold The Same, unto said assignee, The Scioto Oil Company, a corporation, its successors and assigns, for the full term of said lease, subject to the stipulations and conditions therein contained and set forth.

The said party of the first part does hereby covenant and warrant to and with said party of the second part, that it is the owner of said lease and has full right to assign and convey the same, that all the terms, conditions and agreements in said lease have been fully performed upon its part, and that it has made and will make no assignment or conveyance to any other person, and that the said oil and gas lease-
58 hold estate created thereby is free and clear of encumbrance, and that it will warrant and defend the peaceable possession of the same unto said party of the second part, its successors and assigns, against any and all persons claiming the same or any part thereof.

In Testimony Whereof, said party of the first part has executed this assignment at Tulsa, Oklahoma, on the day and year first above written.

NUMBER ONE OIL COMPANY,

(Seal)

By (Signed) C. N. Haskell,
President.

Attest:

(Signed) Jos. Haskell, Secretary.

State of Oklahoma,

County of Tulsa—ss.

Before me, a Notary Public in and for said County and State, on this 10th day of November, 1913, personally appeared C. N. Haskell, to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its President, and acknowledged to me that he executed the same as his free and voluntary act and deed, and as the free and voluntary act and deed of such corporation for the uses and purposes therein set forth.

(Signed) PAUL KONZ,

(Seal)

Notary Public.

My commission expires January 21, 1917.

State of Oklahoma,
Oklahoma County—ss.

I, Jno. R. Williams, Secretary to the Commissioners of the Land Office of the State of Oklahoma, do hereby certify that the above and foregoing is a true and correct copy of the Assignment of Lease from the Number One Oil Company to The Scioto Oil Company as the same appears on file in the office of the Commissioners of the Land Office of the State of Oklahoma.

Witness my hand this 29th day of November, 1913.

.....

59 Endorsed: Bill of Complaint, filed in the U. S. District Court, April 9, 1914.

60 Plea of Intervention of the State of Oklahoma, Ex Rel Lee Cruce, Governor and the Commissioners of the Land Office.

United States of America, Plaintiff.

No. 75. vs. Equity.

The Brewer-Elliott Oil and Gas Company, a corporation; Pawnee-Osage Oil and Gas Company, a corporation; Chickosage Oil and Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil and Gas Company, a corporation; The Scioto Oil Company, a corporation, Defendants.

The State of Oklahoma, ex rel Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma, Intervenors.

Now comes the State of Oklahoma on the relation of Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma, and for their plea of intervention herein, admit the truth of all of the allegations contained in the first and second paragraphs of the bill of complaint herein.

1. They also admit all the allegations contained in the third paragraph of said bill of complaint, except those allegations wherein it is alleged that the Cherokee Nation of Indians by their deed of conveyance of June 14th, 1883, conveyed to the United States in trust for the use and benefit of said Osage Tribe of Indians the islands in the Arkansas River Opposite to the lands described in said deed, and conveyed to

the said Osage Tribe, except Beaver and Turkey islands in Township 23 North, Range 3 East, and said islands, with the exception of Beaver and Turkey islands mentioned, were made a part and parcel of the lands set apart for the Osage Tribe of Indians. The Intervenor herein deny that the plaintiff or the Osage Tribe of Indians has any right, title, claim or interest therein, but Intervenor allege that all of said islands in said Arkansas River bed which lies above high water mark are the property of and belong to the United States of America.

II. The said Intervenor admit all the allegations contained in the fourth, fifth and sixth paragraphs of said bill of complaint, except the allegation contained in the latter part of the sixth paragraph, wherein it is alleged that the Osage Tribe of Indians is the owner of all the oil, gas, coal and other minerals in said Osage Indian Reservation, subject to the supervision and control of the plaintiff, which extend to and are bounded on the south and west by the Creek Country and the main channel of the Arkansas River. The Intervenor herein deny that the plaintiff or the Osage Tribe of Indians has any right, title, claim or interest in the land in controversy herein which lies below the high water mark in the bed of the Arkansas River; but Intervenor allege that all of said land which lies below said high water mark is the State of Oklahoma, and the beneficial interests therein belongs to the property of and belongs to the lessees of the State of Oklahoma and their assigns, as hereinafter more fully set forth.

III. They also admit the allegation contained in the seventh, eighth, ninth and tenth paragraphs of said bill of complaint.

IV. Said Intervenor deny each and every allegation contained in plaintiff's eleventh paragraph of said bill of complaint.

V. The said Intervenor admit all the allegations contained in the twelfth paragraph of said bill of complaint, except those allegations wherein it is alleged that the drilling operations and the erection of oil derricks are obstructions to navigation, and that the same are wholly unauthorized and contrary to the laws of the United States, and are subject to be abated and removed by injunction, as prayed for in the bill of complaint. The Intervenor herein deny that the prospecting for oil and gas and the erection of oil derricks and drilling operations in the bed of the Arkansas River below

high water mark constitute an obstruction to navigation in
the said Arkansas River such as would amount to a
62 violation of the laws of the United States.

VI. Said Intervenor deny the allegations contained in the thirteenth paragraph of said bill of complaint, but Intervenor allege that all of said land described in the bill of complaint which lies below high water mark along the left bank of the Arkansas River is the property of and belongs to the State of Oklahoma, and the beneficial interest therein belongs to the lessees of the State of Oklahoma and their assigns, as hereinafter more fully set forth.

VII. The said Intervenor admit the execution by the Commissioners of the Land Office of the State of Oklahoma of the several leases for oil and gas purposes on the several tracts of land to the lessees therein named, as set forth in the eighth paragraph of said bill of complaint, but deny that said leases are illegal and void as therein set forth, but on the contrary the intervenors allege and charge that each of said leases are valid, and in all respects legal and binding upon these Intervenor, and upon the lessees therein named, and their assigns, as well as against any claim asserted against them by the complainant herein, and the said Intervenor expressly allege that said leases are legal and binding, and convey to the lessees and their assigns all the rights, interest and privileges set forth in the several leases mentioned in the bill of complaint and attached thereto marked "Exhibit A, B, C, D, E, F, and G", and that said lessees and their assigns have full and unrestricted right to operate oil and gas wells on said premises specifically described in said leases, and in said eighth paragraph of said bill of complaint, under the terms and provisions of said leases. Said Intervenor admit that said leases were executed by the Commissioners of the Land Office under and in pursuance of the Laws of the State of Oklahoma without the consent of the complainant or the Osage Tribe of Indiana, and without the approval of the Secretary of the Interior, and they deny that the operation
63 of oil and gas leases under the provisions of said leases would constitute continuous trespass upon said tracts or parcels of land in violation of the rights of plaintiff, or the laws of the United States or constitute waste of any estate which the said Osage Tribe of Indians has in said land, or that the operation of said leases will in any way damage or injure the said complainant, or the Osage Tribe of Indians.

VIII. Intervenor admit that the several defendants herein are properly joined in this action for the purpose of avoid-

ing a multiplicity of suits, as alleged in the fifteenth paragraph of said bill of complaint, and for the purpose of cancelling said leases and admit that if the plaintiff, the United States of America, has any right title claim or interest in and to the said several tracts or parcels of land this suit is properly brought by the plaintiff as the trustee and guardian for the Osage Tribe of Indians in Oklahoma; but Intervenor deny that any such right title claim or interest on the part of said complainant the United States of America as trustee and guardian for the said Osage Tribe of Indians or otherwise with regard to the several tracts or parcels of land or any portion thereof as set forth in the eighth paragraph of said bill of complaint.

IX. The State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma for their ground of intervention herein allege that the Arkansas River is a meandered fresh water non-titled stream and that at all the dates and times mentioned in said bill of complaint said stream was and is now a navigable stream under the laws of the United States and since admission of the State of Oklahoma into the Union on the 16th day of November 1907 the said Arkansas River in the places mentioned in the said bill of complaint was and is now under the laws of the State of Oklahoma a navigable stream and that both the United States of America and the State of Oklahoma have at all times
64 treated and dealt with said stream as a navigable stream; that in making the survey of the lands adjacent to the banks of said Arkansas River throughout its course in the State of Oklahoma, the United States public surveyors in pursuance to laws, rules, regulations and requirements of the Commissioner of the Land Office of the United States, meandered said Arkansas River and did not extend the lines of said survey across the same, but reserved the bed of said River lying below high water mark along the bank on either side thereof from said survey, and from the patents and any and all other conveyances of said lands, thereby withholding the bed of said River below high water mark on either side thereof from disposition under the patents or other conveyances thereafter to be issued, and issued for the disposition of said lands along the banks of said river, and at the time of the admission of the State of Oklahoma into the Union, said several tracts of land described in the bill of complaint, which lie below the high water mark in the bed of said Arkansas River, was reserved and held in trust by the United States for the State of Oklahoma, and on the admission of the State of Oklahoma into the Union, it became, by virtue of its inher-

ent sovereignty, the owner of the bed of said river below high water mark along the banks thereof, together with the oil and gas and other minerals situated therein, and is now the owner of the bed of said river, including the several tracts or parcels of land described in the eighth paragraph of the said bill of complaint.

The Intervenor further allege that under and by virtue of said ownership and in accordance with the laws of the State of Oklahoma, and the rules and regulations and requirements of the Commissioners of the Land Office of the State of Oklahoma, said Commissioners of the Land Office duly and legally executed the several oil and gas mining leases mentioned in said bill of complaint, and that said gas and oil leases are in all respects legal and binding upon the lessees, and confers upon the lessees therein named, and their assigns, each and every

65 right, privilege, estate and interest set forth in said leases, and that said lessees, and their assigns, have the right to operate oil and gas wells on said several tracts or parcels of land under the provisions of said leases, and to take and receive for their own use and benefit all the oil and gas taken from said several tracts or parcels of land, except the rental, royalties and bonuses therein reserved to the State of Oklahoma; and the State of Oklahoma, through its Commissioners of the Land Office, has the right to dispose of all of said rentals, royalties and bonuses mentioned and set forth in said several leases, in accordance with the laws of the State of Oklahoma.

Therefore, the premises considered, the said Intervenor, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, pray that they be permitted to interplead herein, and to assert the right of the State of Oklahoma to the several tracts or parcels of land, and the oil and gas, rentals, royalties, and bonuses provided for in said leases, and any other right, claim or title which the State of Oklahoma may establish to said tracts or parcels of land, and that on final hearing a judgment be rendered in favor of the State of Oklahoma to the said several tracts or parcels of land and the oil and gas therein, and that the State of Oklahoma be adjudged to be the owners thereof, and that the plaintiff be decreed to have no claim or title thereto, and that the lessees mentioned in said bill of complaint, and their assigns, be permitted to operate said leases in accordance with the provisions thereof, free from any hindrances on the part of said complainant, and that the Intervenor be awarded all

other relief, both general and special, to which they may be entitled.

THE STATE OF OKLAHOMA, ON THE
RELATION OF LEE CRUCE, GOVERN-
OR, AND THE COMMISSIONERS OF
THE LAND OFFICE OF THE STATE
OF OKLAHOMA,
By Jas. H. Chambers, Attorney.

Sate of Oklahoma,
Oklahoma County—ss.

66 I, Jas. H. Chambers, Attorney for the Intervenors, in
the above styled cause, after being sworn on oath, state
that the allegations of fact contained in the foregoing
plea of intervention are true as I verily believe.

JAS. H. CHAMBERS.

Subscribed and sworn to before me on this the 27 day of May,
1914.

(Seal)

FRANK B. LUCAS,
Notary Public.

My commission expires January 3, 1915.

Endorsed: Filed in the District Court on June 11, 1914.

67 Answer of the Arkansas River Bed Oil and Gas
Company.

United States of America, Plaintiff,
No. 75. vs. Equity.

The Brewer-Elliott Oil and Gas Company, a corporation;
Pawnee-Osage Oil and Gas Company, a corporation;
Chickosage Oil and Gas Company, a corporation; Num-
ber One Oil Company, a corporation; Arkansas River
Bed Oil and Gas Company, a corporation; and the
Scioto Oil Company, a corporation, Defendants.

I.

Now comes the Arkansas River Bed Oil and Gas Company,
one of the defendants in the above styled cause, and for its
answer herein, hereby adopts each and all of the allegations
of fact contained in the plea of intervention filed herein on be-
half of the State of Oklahoma and the Commissioners of the
Land Office of the State of Oklahoma, and hereby makes the
same admissions of fact which are made by said intervenors,

but this defendant reserves the right to make further answer herein by way of amendment or substitution for this answer.

II.

This defendant alleges that the oil and gas lease mentioned in said complaint as having been executed to this defendant by the Commissioners of the Land Office of the State of Oklahoma, covering the premises described in said bill of complaint, is in all respects a valid and binding lease, and that this defendant, and its assigns, is entitled to hold and own all of the estate, rights and interests therein conferred on this defendant.

III.

68 The said defendant hereby approves and consents to the stipulation filed herein by the plaintiff, the United States of America for itself and as trustee and guardian for the Osage Tribe of Indians, and the Intervenor, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and hereby consents to the appointment of the Receiver for all oil and gas rentals, royalties and bonuses claimed by the said plaintiff and intervenors, and this defendant further consents to the designation of the oil and gas experts named in said stipulation, as representatives of the said plaintiff and the said intervenors, to be charged with the duty of supervising the operation of oil and gas wells on the premises described in said bill of complaint as having been leased by the State of Oklahoma to this defendant, and this defendant further consents to and accepts the benefits of said agreement.

Wherefore, this defendant prays that the plaintiff take nothing by this suit; that the premises described in said bill of complaint as having been leased by the State of Oklahoma through its Commissioners of the Land Office to this defendant, be adjudged to be the property of the State of Oklahoma, and that said lease be declared to be legal and binding, and that this defendant be decreed to be the owner of all oil and gas taken from said premises during the life of said lease, except the rentals, royalties and bonuses therein agreed to be paid to the State of Oklahoma, and that this defendant have all other relief to which it may be entitled both in law and in equity.

W. N. REDWINE,
Attorney for Defendant.

Endorsed: Filed in the District Court on June 11, 1914.

69 Answer of the Brewer-Elliott Oil and Gas Company.

I.

Now comes the Brewer-Elliott Oil and Gas Company, one of the defendants in the above styled cause, and for its answer herein, hereby adopts each and all of the allegations of fact contained in the plea of intervention filed herein on behalf of the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and hereby makes the same admissions of fact which are made by said intervenors, but this defendant reserves the right to make further answer herein by way of amendment or substitution for this answer.

II.

This defendant alleges that the oil and gas lease mentioned in said complaint as having been executed to this defendant by the Commissioners of the Land Office of the State of Oklahoma, covering the premises described in said bill of complaint, is in all respects a valid and binding lease, and that this defendant, and its assigns, is entitled to hold and own all of the estate, rights and interest therein conferred on this defendant.

70

III.

The said defendant hereby approves and consents to the stipulation filed herein by the plaintiff, the United States of America, for itself and as trustee and guardian for the Osage Tribe of Indians, and the Intervenor, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and hereby consents to the appointment of the Receiver for all oil and gas rentals, royalties and bonuses claimed by the said plaintiff and intervenors, and this defendant further consents to the designation of the oil and gas experts named in said stipulation, as representatives of the said plaintiff, and the said intervenors, to be charged with the duty of supervising the operating of oil and gas wells on the premises described in said bill of complaint as having been leased by the State of Oklahoma to this defendant, and this defendant further consents to and accepts the benefits of said agreement.

Wherefore, this defendant prays that the plaintiff [taken] nothing by this suit; that the premises described in said bill of complaint as having been leased by the State of Oklahoma through its Commissioners of the Land Office to this defendant, be adjudged to be the property of the State of Oklahoma, and that said lease be declared to be legal and binding, and

that this defendant be decreed to be the owner of all oil and gas taken from said premises during the life of said lease, except the rentals, royalties and bonuses therein agreed to be paid to the State of Oklahoma, and that this defendant have all other relief to which it may be entitled both in law and in equity.

JAS. H. CHAMBERS,
Attorney for defendant.

Endorsed: Filed in the District Court on June 11, 1914.

71 Answer of the Chickosage Oil and Gas Company.

I.

Now comes the Chickosage Oil & Gas Company, one of the defendants in the above styled cause, and for its answer herein, hereby adopts each and all of the allegations of fact contained in the plea of intervention filed herein on behalf of the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and hereby makes and the same admissions of fact which are made by said intervenors, but this defendant reserves the right to make further answer herein by way of amendment or substitution for this answer.

II.

This defendant alleges that the oil and gas lease mentioned in said complaint as having been executed to this defendant by the Commissioners of the Land Office of the State of Oklahoma, covering the premises described in said bill of complaint, is in all respects a valid and binding lease, and that this defendant, and its assigns, is entitled to hold and own all of the estate, rights and interest therein conferred on this defendant.

72

III.

The said defendant hereby approves and consents to the stipulation filed herein by the plaintiff, the United States of America for itself and as trustee and guardian for the Osage Tribe of Indians, and the Intervenor, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and hereby consents to the appointment of the Receiver for all oil and gas rentals, royalties and bonuses claimed by the said plaintiff and intervenors, and this defendant further consents to the designation of the oil and gas experts named in said stipulation, as representatives of the said plaintiff and the said intervenors, to be charged with the duty of supervising the operating of oil and gas wells on the premises

described in said bill of complaint as having been leased by the State of Oklahoma to this defendant, and this defendant further consents to and accepts the benefits of said agreement.

Wherefore, this defendant prays that the plaintiff take nothing by this suit; that the premises described in said bill of complaint as having been leased by the State of Oklahoma through its Commissioners of the Land Office to this defendant, be adjudged to be the property of the State of Oklahoma, and that said lease be declared to be legal and binding, and that this defendant be decreed to be the owner of all oil and gas taken from said premises during the life of said lease, except the rentals, royalties and bonuses therein agreed to be paid to the State of Oklahoma, and that this defendant have all other relief to which it may be entitled both in law and in equity.

JAS. H. CHAMBERS,
Attorney for defendant.

Endorsed: Filed in the District Court on June 11, 1914.

73 Answer of the Pawnee-Osage Oil and Gas Company.

I.

Now comes the Pawnee-Osage Oil & Gas Company, one of the defendants in the above styled cause, and for its answer herein, hereby adopts each and all of the allegations of fact contained in the plea of intervention filed herein on behalf of the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and hereby makes and the same admissions of fact which are made by said intervenors, but this defendant reserves the right to make further answer herein by way of amendment or substitution for this answer.

II.

This defendant alleges that the oil and gas lease mentioned in said complaint as having been executed to this defendant by the Commissioners of the Land Office of the State of Oklahoma, covering the premises described in said bill of complaint, is in all respects a valid and binding lease, and that this defendant, and its assigns, is entitled to hold and own all of the estate, rights and interest therein conferred on this defendant.

III.

74 The said defendant hereby approves and consents to the stipulation filed herein by the plaintiff, the United States of America for itself and as trustee and guardian for the Osage Tribe of Indians, and the Intervenor, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and hereby consents to the appointment of the Receiver for all oil and gas rentals, royalties and bonuses claimed by the said plaintiff and intervenors, and this defendant further consents to the designation of the oil and gas experts named in said stipulation, as representatives of the said plaintiff and the said intervenors, to be charged with the duty of supervising the operation of oil and gas wells on the premises described in said bill of complaint as having been leased by the State of Oklahoma to this defendant, and this defendant further consents to and accepts the benefits of said agreement.

Wherefore, this defendant prays that the plaintiff take nothing by this suit; that the premises described in said bill of complaint as having been leased by the State of Oklahoma through its Commissioners of the Land Office to this defendant, be adjudged to be the property of the State of Oklahoma, and that said lease be declared to be legal and binding, and that this defendant be decreed to be the owner of all oil and gas taken from said premises, during the life of said lease, except the rentals, royalties and bonuses therein agreed to be paid to the State of Oklahoma, and that this defendant have all other relief to which it may be entitled both in law and in equity.

JAS. H. CHAMBERS,
Attorney for Defendant.

Endorsed: Filed in the District Court on June 11, 1914.

75 (Stipulation as to the Production of Oil and Gas, etc.)

United States of America, Plaintiff,
No. 75 vs. Equity.

The Brewer-Elliott Oil and Gas Company, a corporation;
Pawnee Osage Oil and Gas Company, a corporation;
Chickosage Oil and Gas Company, a corporation;
Number One Oil Company, a corporation; Arkansas
River Bed Oil and Gas Company, a corporation, The
Scioto Oil Company a corporation, Defendants.

The State of Oklahoma, [er] rel, Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma, Intervenors.

Comes now the complainant herein, the United States of America, and the intervenors, the State of Oklahoma, ex rel, Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma, and enter into the following stipulations and agreement:

Whereas, the ownership and right to the possession of the lands described in plaintiff's bill of complaint herein, in so far as the same relates to all that portion of the bed of the Arkansas River below high water mark where it bounds the Osage Nation, and the deposits of oil and gas underlying said lands, is the subject of controversy between plaintiff and said intervenors to be determined in this suit, plaintiff claiming title and right of possession to be in its ward, the Osage Tribe of Indians, and said Intervenors claiming title and right of possession to be in themselves and their lessees, the defendants herein, and

Whereas, it is believed by plaintiff and said intervenors to be desirable that the production of oil and gas from said lands be gone forward with pending this suit, and pending the ultimate determination of the ownership and right to the possession of said lands, and

76 Whereas to that extent it is satisfactory to plaintiff and said intervenors for such production to proceed under the leases heretofore executed by said intervenors to the defendants herein, which said leases are sought by the plaintiff's bill of complaint to be cancelled, and copies of which are attached to said bill as Exhibits A, B, C, D, E, F, and G;

Now, Therefore, it is stipulated and agreed by and between the plaintiff and said intervenors that pending the final determination of this suit, the production of oil and gas from said lands shall be proceeded with under said leases; that such production shall be in strict accordance with the terms of said leases and the rules and regulations heretofore promulgated by the Commissioners of the Land Office of the State of Oklahoma, and shall be under the immediate supervision and control of a Supervisory Committee of two persons, one of whom shall be Robt. L. Lunsford as the representative of said intervenors, and the other of whom shall be Dr. J. J. Rutledge as the representative of plaintiff; provided,

that plaintiff may at any time substitute a new representative on said Supervisory Committee by giving five days written notice to said intervenors of its intention so to do, such notice to contain the name of such new representative, and the time when his appointment shall take effect, and said intervenors may at any time substitute a new representative on said Supervisory Committee by giving like notice to plaintiff; that the representative of complainant on said Supervisory Committee shall have his compensation and expenses wholly paid by plaintiff, and the representative of said intervenors on said Supervisory Committee shall have his compensation and expenses wholly paid by said intervenors; that the said Supervisory Committee shall have the power and authority, and it shall be their duty, for and on behalf of the plaintiff and said intervenors, and under the said leases and the said rules and regulations, to determine all questions concerning the proper production of oil and gas from said lands, and the proper development and operation of wells thereon, and to determine the amount of rental, royalties and bonuses accruing from each lease, and from the operation of each well, whether oil or gas, and to make report thereof to this court as often as once in [ever] thirty days, showing the amount of oil and gas produced and sold from each of said leases, and the prices obtained therefor, together with all other matters and questions concerning the proper development of the premises covered by each of said leases, and the operation of each of said wells; that for the purpose of making effective the power and authority hereby conferred, and of facilitating the performance of the duties hereby imposed on said Supervisory Committee, this court may by its order empower the members of said Supervisory Committee, as officers of and under the control of the court, to go upon the said lands at any time and make such inspections and investigations as will enable them to exercise properly their power and authority, and to discharge efficiently their duty under this stipulation and the order of court to be entered pursuant hereto; that if for any reason the members of said Supervisory Committee should be unable to agree concerning any matter with which they may be presented in the discharge of their duty under this stipulation, they shall have authority to call in some third person for the settlement of the disputed questions, and the concurring opinion of any two of the three shall control; provided, that if the members of said Supervisory Committee should be unable to agree on a third person for that purpose, then the court may appoint some third person therefor; that oil and gas produced from

said lands under said leases over and above the rental, royalty and bonus portion thereof shall become and be the property of said lessees, and their assigns, free of any claim of plaintiff or the said intervenors; that the rental, royalty and bonus portion of all the oil and gas produced from said lands under the said leases shall be sold and removed from the said

lands only as first authorized and directed by the said
78 Supervisory Committee, but the same shall be sold by or under the direction of the said supervisory Committee at least once every thirty days, and the proceeds thereof shall be paid by or for the purchasers under the direction of the said Supervisory Committee to a receiver, who shall have been appointed as hereinafter stipulated; that for the purpose of receiving and collecting the proceeds of the rentals, royalties and bonuses accruing from the production of oil and gas under the said leases, a Receiver shall be appointed by the Court, to whom, instead of to said Intervenor or Plaintiff herein, payment of the proceeds of the said rentals, royalties and bonuses shall be made by any person, firm or corporation from whom or from which the same may be due, with the like effect as if made to said Intervenor or Plaintiff; and said Receiver is hereby constituted the sole agent of the said Intervenor and of Plaintiff, to receive and collect the proceeds of the said rentals, royalties and bonuses; that accordingly, it shall be and is hereby made the duty of said Receiver to receive and collect promptly and diligently all such proceeds of the said rentals, royalties and bonuses, and to safely keep and preserve the same subject to be disbursed only under an order of court to whomsoever may ultimately be adjudged to be the owner of said lands and entitled thereto; that the said Receiver shall be required to enter into and file with the Clerk of this court a good and sufficient bond, with solvent surety, to be approved by the Judge of this Court, for the faithful performance of his duty under this stipulation and the order of court to be entered pursuant thereto, and for the safe keeping of the funds that may come into his hands; that such bond shall be executed in the first instance in the sum of Twenty-five Thousand (\$25,000.00) Dollars, and shall be increased from time to time if necessary; so as to exceed always by as much as ten (10%) per cent of the amount of the funds that may be in his hands or under his control as such receiver; that the Receiver shall deposit such funds in some bank or banks to be selected by him, taking therefor security of the kind provided for by Section 7654 of the Revised Laws of the State of Oklahoma, 1910; pro-

vided, that such bank or banks shall agree to pay not
79 less than four (4%) per cent interest upon the average
daily balances of such deposit or deposits; such average
to be determined for and placed to the [credit] of such Receiver
at the end of each calendar month; and provided further,
that no deposit shall be made in any bank to an amount
in excess of the [capital] stock and surplus of such bank;
that the said Supervisory Committee shall report, or cause
to be reported, to the said Receiver, the rentals, royalties and
bonuses accruing from the production of oil and gas from the
lands covered by each of said leases, and the said Receiver
shall accurately keep a [separate] account of the the operation
production under each of said leases; that he shall keep
accurate and [separate] accounts of his doings under his order
of appointment, and of the funds that come into his custody,
and of the sources from which they came, and of his disposition
of the said funds, and the description of the security taken
therefor, and shall file in the court in this cause, within
the first ten days of each calendar month a true and complete
statement under oath of his accounts; that such receiver shall
receive as his compensation for all of his services, such sums
as the court may from time to time allow therefor; but that
such sums shall in no event exceed in the aggregate one per
centum of the amounts that may come into his hands or under
the control of said Receiver under this stipulation, and in addition
he shall be allowed his actual and necessary expenses incurred
in discharging his duty as such receiver, including an allowance
to cover the actual and necessary premium on his bond or bonds,
and shall incorporate a statement of such expenses in the verified
statements to be filed in the court during the first ten days of
each calendar month, as aforesaid; provided, that such Receiver
shall not reimburse himself for such expenses until said statement
has first been approved by the Judge of this Court; that such
Receiver shall be empowered by order of the court to take full
custody and control of the said lands, subject only to the production
of oil and gas therefrom under the said leases, and shall be
80 given power and authority to go upon the said lands at
any time, and make such inspections and investigations as
will enable him to exercise properly his power and authority
to discharge his duty under this stipulation, and the order of
court to be entered pursuant hereto.

It is further stipulated and agreed that the court may appoint
as such Receiver..... of....., Oklahoma,
who shall be required before entering on the performance of

his functions as Receiver, to take and subscribe an oath to be filed in court, to perform faithfully, diligently and impartially his duties as such Receiver, and to keep safely and disburse only as directed by the court, the funds that may come into his custody and under his control, and who also before entering on the performance of his functions as Receiver, shall first have executed and filed a bond in the sum and manner and approved as hereinbefore set forth.

It is further stipulated and agreed that within five days after the appointment and qualification of said Receiver that said Commissioners of the Land Office of the State of Oklahoma will pay him whatever sums they have received under the said leases, whether as bonuses or otherwise, and the same shall constitute an integral part of the funds to be held by the Receiver in his capacity as such.

It is further stipulated and agreed that should said lessees, their assigns, or any of them, fail, neglect or refuse to proceed with the drilling of wells and the production of oil and gas under and in strict accordance with the terms of said leases and the said rules and regulations, it shall become and it is hereby made, the duty of said Supervisory Committee to demand of said lessees, or its assigns, that he or it make good his or its default, and on his or its failure so to do, within a reasonable time, then to report such fact to this court, and

81 the court shall have and is hereby given authority, after notice and hearing, and if in its opinion the facts warrant, to enter its order setting aside and cancelling the lease of any such delinquent lessees, or his or its assigns, and thereupon to order and direct the Receiver to take charge immediately of said property and operate the same under order of the court; and it is stipulated and agreed that should any lessee, or his or its assign, wilfully or fraudulently conceal or attempt to [conceals] any of the production of oil and gas from said leased premises, or wilfully or fraudulently fail, neglect or refuse to give to said Supervisory Committee or to the receiver appointed hereunder, or to the court when demanded a correct account of the oil and gas produced from his or its leased premises for any designated period, and promptly to pay the royalty thereon, then such failure, neglect and refusal shall work a forfeiture of the lease of such lessee, or his or its assign, and the court may thereupon by proper order cancel said lease, and order and direct the Receiver appointed hereunder to take charge of the premises covered

thereby, and to operate the same; provided that any breach or violation of the provisions of any of said leases which has occurred prior to the date of the filing of this stipulation may not, but the continuance or recurrence of any such breach or violation after the date of the filing of this stipulation may be made the basis for such forfeiture on the part of said Supervisory Committee or this court, but nothing herein shall waive any prior ground of forfeiture claimed by the intervenors.

This stipulation is not to be taken as a recognition or concession by plaintiff of any title or interest of intervenors in and to the said lands, and the oil and gas thereunder, or as a recognition of the validity of said leases, or as a recognition or concession of said intervenors of any title or interest of plaintiff in and to the said lands and the oil and gas thereunder, and is entered into for the sole purpose of hastening the development and conservation of the oil and gas underlying the said lands, and for the protection of whomsoever may ultimately be decreed by the court to be the owner of and entitled thereto, said development and conservation being necessary by reason of the oil and gas development and operations on the adjacent uplands, and nothing herein contained shall operate to relieve any lessee from fulfilling any agreement he may have with the Commissioners of the Land Office of the State of Oklahoma relative to the costs of litigation.

It is further stipulated and agreed that upon the final determination of this suit, all structures erected in the said river bed involved herein shall be removed, if said river is held navigable, and the court determines that the laws of the United States authorizes and require said removal, unless lawful authority is procured for the continuance of said structures in said river bed.

ISAAC D. TAYLOR,
United States Attorney,
Solicitor for Plaintiff.

JAMES H. CHAMBERS,
Attorney for the Commissioners of the
Land Office of the State of Oklahoma, So-
licitor for said Intervenors.

Endorsed: Filed in the District Court on June 11, 1914.

- 83 (Order appointing Frank H. McGuire Receiver and defining his duties, and also appointing a committee of two persons to supervise oil and gas operations.)

On this the 15th day of June, 1914, this cause came on to be heard on the application of the complainant, the United States of America, represented by Isaac D. Taylor, United States Attorney, and the intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, represented by James H. Chambers, their attorney, for the appointment of a receiver and for the appointment of a committee composed of two persons to supervise the production of oil and gas under the leases mentioned in the bill of complaint, and thereupon as constituting such application, said complainant and intervenors having presented to the court their stipulation in writing and asked permission to have the same filed, which permission the court has granted, in which stipulation the appointment of said receiver and the supervisory committee and the terms under which and the extent to which they shall act as such are agreed to, and it appearing to the court that the grounds for the appointment of a receiver set forth in said stipulation are sufficient.

It is hereby ordered, adjudged and decreed that Frank H. McGuire, of Guthrie, Oklahoma, be, and he is hereby appointed receiver in the above styled cause, and upon the execution by the said Frank H. McGuire of a good and sufficient bond in the sum of Twenty-five Thousand Dollars with solvent surety to be approved by the Judge of this Court, which bond shall be filed with the Clerk of this Court and shall be increased from time to time if necessary so as to exceed always by as much as 10% of the amount of the funds that may be in the hands or under the control of said receiver as such, and which bond shall be so conditioned as to require the said Frank H. McGuire as such receiver to comply punctually with each and all of the orders of the court herein and to account faithfully, accurately and punctually for all moneys that may come into his hands as such receiver, and to disburse the same only as directed by the court, and upon his taking and subscribing an oath to be filed in court in this cause to perform faithfully, diligently and impartially his duties as receiver herein and to keep safely and disburse only as directed by the court the funds that may come into his custody or under his control, then he, the said Frank H. McGuire, shall be and is hereby authorized and directed to receive and hold subject to the

order of the court, all funds that may be paid to him
as such receiver under the provisions of this order
85 and of the stipulation filed in this court on the 11th day
of June, 1914, and executed by the complainant and
the intervenors herein.

It is hereby made the duty of said receiver to collect and
receive promptly and diligently all rentals, royalties and
bonuses due or to become due from any person, firm or cor-
poration under the leases described in the bill of complaint
herein, and safely to keep and preserve the same subject to
be disbursed only under an order of this court to whomsoever
may ultimately be adjudged to be the owner of the lands de-
scribed in the bill of complaint herein, and entitled thereto;
and said receiver is hereby required and directed to deposit
such funds in some bank or banks to be selected by him, first
taking therefor security of the kind provided for by Section
7654 of the Revised Laws of the State of Oklahoma of 1910,
or else first taking as security therefor, a bond or bonds in
the aggregate sum of not less than the amount so deposited,
with at least one surety on each such bond, which surety shall
be a surety company holding a certificate of authority from
the Secretary of the Treasury of the United States under the
Acts of Congress of August 13, 1894 and March 23, 1910, as
acceptable sureties on federal bonds, such bond or bonds, be-
fore becoming effective, to be presented to and approved by
the Judge of this Court, provided, that in the discretion of
the said receiver he may take from such depository bank or
banks, or any of them, both kinds of security mentioned in this
paragraph; and he shall require such bank or banks to pay not
less than 3% interest upon the average daily balances
86 of such deposit or deposits, such average to be deter-
mined for and to be deposited to the credit of said re-
ceiver at the end of each calendar month; but no deposit shall
be made in any bank to an amount in excess of the capital
stock and surplus of such bank.

And said receiver is hereby ordered and directed to keep
an accurate and separate account of the production under each
of said leases and to keep an accurate and separate account of
all his doings under this order of appointment, and of the
funds that come into his custody and of the sources from which
they come and of the disposition of said funds and a descrip-
tion of the security taken therefor, and shall file in this court
in this cause within the first ten days of each calendar month
a true and complete statement under oath of his accounts for
the preceding month;

that said receiver shall receive as his compensation for all his services herein, such sums as the court may from time to time allow therefor, but such sums shall in no event exceed in the aggregate one per centum of the amount that may come into his hands or under the control of said receiver under said stipulation and this order, and in addition thereto he shall be allowed his actual and necessary expenses incurred in discharging his duty as such receiver, including an allowance to cover the actual and necessary premium on his bond or bonds, and shall incorporate a statement of such expenses in the verified statement which he is hereby required to file in court during the first ten days of each calendar month, provided, that he shall not reimburse himself for my expenses until such statement has first been approved by the judge of this court.

87 The said receiver is hereby authorized and directed to receive and collect from the Commissioners of the Land Office of the State of Oklahoma within ten days after his qualification under this order of appointment whatever sum or sums they may have received under the said leases, whether as bonus or otherwise, and the same shall constitute an integral part of the funds to be held by the said receiver in his capacity as such.

And said receiver is hereby ordered to take full custody and control of the several tracts or parcels of land described in said bill of complaint, subject only to the possession of the lessees or their assigns for the production of oil and gas therefrom under the said leases, and he is hereby empowered and authorized to go upon said several tracts or parcels of land at any time and make such inspections and investigations as will in his judgment enable him to perform properly his duties, power and authority under this order of appointment.

It is further ordered, adjudged and decreed that pending the final determination of this suit, the production of oil and gas from said lands shall be proceeded with under the said leases, and that such production shall be in strict accordance with the terms of said leases and the rules and regulations heretofore promulgated by the Commissioners of the Land Office of the State of Oklahoma and shall be under the immediate supervision and control of a supervisory committee of two persons, one of whom shall be Robert L. Lunsford, of Cleveland, Oklahoma, who is hereby appointed as the representative of said intervenors on the said committee, and the other of whom shall be Dr. J. J. Rutledge, who is hereby ap-

pointed as the representative of complainant of said committee, provided that complainant may at any time substitute a new representative on said supervisory committee by giving five days written notice to said intervenors of its intention so to do, such notice to contain the name of such new representative and the time when his appointment shall take effect, and said intervenors may at any time substitute a new representative on said supervisory committee by giving like notice to complainant; that said supervisory committee be, and they hereby are, given power and authority, and it is hereby made their duty for and on behalf of complainant and said intervenors, and under the said leases and the said rules and regulations to determine all questions concerning the proper production of oil and gas from said lands, and the proper development and operation of oil and gas wells thereon, and to determine the amount of rental, royalty and bonus accruing from the operation of each well, whether oil or gas, and to make report thereof to this court as often as once in every thirty days, showing the amount of oil and gas produced and sold from each of said leases and the price obtained therefor, together with all other matters and questions concerning the proper development of the premises covered by each of said leases and the operation of each of said wells; that in the execution of the power and authority hereby conferred and in the discharge of the duty hereby imposed on said supervisory committee, the members thereof are hereby authorized and empowered to go upon the said several tracts or parcels of land described in the bill of complaint at any time and to make such inspections and investigations as will enable them to exercise properly the power and authority hereby conferred and to discharge properly the duty hereby imposed on them; that if for any reason the members of said supervisory committee should become unable to agree concerning any matter with which they may be presented in the discharge of their duties under the said stipulation and this order of court, they shall have authority to call in some third person for the settlement of the disputed question, and the concurring opinion of any two of the three shall control, provided, that if the members of said supervisory committee should be unable to agree on a third person for that purpose, then the court may appoint some third person therefor.

It is further ordered and adjudged that all oil and gas produced from any of said lands under the said leases in excess of the amount stipulated in said leases to be paid as rentals, royalties and bonuses, shall become and be the property of the

lessees of the Commissioners of the Land Office of the State of Oklahoma and their assigns, free of any claim on the part of complainant or the said intervenors; that the rental, royalty and bonus portion of all the oil and gas produced from said lands under the said leases shall be sold and removed from the said lands only as first authorized and directed by the said supervisory committee, but the same shall be sold by or under the direction of the said supervisory committee at least once every thirty days, and the proceeds thereof shall be paid by or for the purchasers under the direction of the said supervisory committee to the said Frank H. McGuire, as the receiver hereby appointed.

It is further ordered, adjudged and decreed that should the said lessees or their assigns, or any of them, fail, neglect
90 or refuse to proceed with the drilling of wells and the production of oil and gas under and in strict accordance with the terms of said leases and said rules and regulations, the said supervisory committee shall demand of such lessee or his or its assign, that he or it make good his or its default, and on his or its failure so to do, within a reasonable time, said supervisory committee shall report such fact to this court, and that should any lessee or his or its assign wilfully or fraudulently conceal or attempt to conceal any of the production of oil or gas from said leased premises, or wilfully or fraudulently fail, neglect or refuse to give to said supervisory committee or to the receiver appointed hereunder or to this court when demanded, a correct account of the oil and gas produced from his or its leased premises for any designated period, and promptly to pay the royalties thereon, then the said supervisory committee or the said receiver shall forthwith report that fact to this court.

It is further ordered, adjudged and decreed that the representative of the complainant on said supervisory committee shall have his compensation and expenses wholly paid by the complainant, and the representative of the intervenors on said supervisory committee shall have his compensation and expenses wholly paid by the intervenors; and in the event of the designating of a third person to arbitrate any difference which may arise between the members of the said supervisory committee as herein provided for, the compensation to and expense of such third person shall be equally borne by the intervenors and complainant.

It is further ordered, adjudged and decreed that any person not at this time a party to this suit who claims any
91 interest in any of the several tracts or parcels of land described in the bill of complaint herein, may be made a

party to this cause and receive the benefits of the said stipulation by subjecting himself to the jurisdiction of this court and agreeing to be bound by the provisions of the said stipulation as filed herein by the complainant and said intervenors on the 11th day of June, 1914.

This order is made subject to such modifications in any particular thereof as the Court may, at any time hereafter, upon due notice to counsel and a hearing, deem necessary and proper for the better conduct of the matters involved.

JOHN H. COTTERAL,
Judge of the United States District Court.

Endorsed: Filed in the District Court on June 15, 1914.

92 Reply to Answer of Pawnee-Osage Oil and Gas Company.

Comes now the United States, plaintiff, and for its reply to the answer of the Pawnee-Osage Oil and Gas Company, herein, denies each and every allegation therein contained, except such as admit allegations of the bill herein, and except such as approve and consent to the stipulation filed herein.

ISAAC D. TAYLOR,
United States Attorney.

Endorsed: Filed in the District Court on July 1, 1914.

93 Answer of United States, Plaintiff, to the Plea of Intervention of the State of Oklahoma, ex rel, Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma.

The plaintiff, now and at all times hereinafter, saving to itself all manner of benefit of exception or otherwise that may be had or taken to the many errors, uncertainties, and imperfections in the said plea of intervention contained, with leave of court first had and obtained, makes answer thereto, or to so much thereof as this plaintiff shall find it is material or necessary for it to make answer to, and says that it denies each and every fact, matter and thing in said plea of intervention contained, not herein expressly admitted.

Referring to the second paragraph of said plea of intervention, this plaintiff denies that the land therein referred to, which lies below high water mark, in the Arkansas River, is the property of and belongs to the State of Oklahoma, and

also denies that the beneficial interest therein belong to the lessees of the State of Oklahoma and their assigns.

Referring to the sixth paragraph in said plea of intervention, this plaintiff denies that all of said land described in the bill of complaint, or any part thereof, which lies below high water mark along the left bank of the Arkansas River is the property of and belongs to the State of Oklahoma, and denies that the beneficial interest therein belongs to the lessees of the State of Oklahoma, and their assigns.

94 Referring to the seventh paragraph in said plea of intervention, this plaintiff denies that the leases therein referred to are valid, or in any way binding, and denies that said leases convey to the said lessees or their assigns, any interest, right or privilege in or to the lands herein involved, or the minerals thereunder.

Referring to the ninth paragraph of said plea of intervention, this plaintiff denies that the Arkansas River is, or ever was a navigable stream in fact or in law, at the places mentioned in the bill herein, or at the places involved in this action, and the plaintiff denies that the United States has at all times treated said river at such places as a navigable stream; and plaintiff admits that said river is at the places mentioned a meandered stream, but denies that said stream was meandered for the purpose of designating it a navigable stream; and plaintiff denies that the Surveyors of the United States reserved the bed of said river lying below high water mark for any purpose; and plaintiff denies that at the time of the admission of the State of Oklahoma into the Union, the said several tracts of land described in the bill herein, which lie below high water mark in the bed of said Arkansas River, were reserved and held in trust by the Government for the State of Oklahoma, and denies that on the admission of the State of Oklahoma into the Union, it became the owner of said river bed involved herein, or any part thereof, or the oil and gas or other minerals therein situated, and denies that the State of Oklahoma is the owner of the several tracts or parcels of land described in the eighth paragraph of the bill herein, or any part thereof; and plaintiff admits the execution of the leases mentioned in said ninth paragraph of said plea of intervention by the Commissioners of the Land Office, but denies that the same are legal and binding and denies that they confer upon the lessees therein named, and their assigns, or any of them, any right, privilege, estate or interest, in or to any of the lands involved herein, or the minerals therein and thereunder; and plaintiff denies that said lessees or

95 [thie] assigns have the right to operate oil and gas wells on the several tracts or parcels of land, or any of them, under the provisions of said leases, or to make and receive any manner of benefit therefrom, and denies that the State of Oklahoma, or the said Commissioners of the Land Office, have any right to the rents, royalties and bonuses from the lands herein involved, or any part thereof, or any right to make disposition thereof.

Wherefore, the plaintiff prays that said intervenors take nothing by their plea of intervention, and that plaintiff be given the relief prayed for in its bill herein.

ISAAC D. TAYLOR,
United States Attorney.

United States of America,
Western District of Oklahoma—ss.

Isaac D. Taylor, United States Attorney for the Western District of Oklahoma, being first duly sworn, on oath states: that he is such officer and an agent of the plaintiff, the United States, that he has read the foregoing answer, and that the allegations therein contained are true, as he verily believes.

ISAAC D. TAYLOR.

Subscribed and sworn to before me this 31st day of July, 1914.

(Seal) M. V. HAWS,
Deputy Clerk U. S. District Court.

Endorsed: Filed in the District Court on July 31, 1914.

96 Answer of Defendant Scioto Oil Company.

The United States of America, Plaintiff,
No. 75. vs. Equity.

The Brewer-Elliott Oil and Gas Company, a corporation;
Pawnee-Osage Oil and Gas Company, a corporation;
Chickosage Oil and Gas Company, a corporation; Num-
ber One Oil Company, a corporation; Arkansas River
Bed Oil and Gas Company, a corporation; the Scioto
Oil Company, a corporation, Defendants.

I.

Now comes the defendant Scioto Oil Company and for its answer to the bill of complaint filed herein, and reserving the right to move to strike certain sections and paragraphs of the bill of complaint herein, and to otherwise plead, adopt each

and all of the allegations contained in the plea of intervention filed herein on behalf of the State of Oklahoma, and affirmatively alleges that each of said allegations are true.

II.

The said defendant Scioto Oil Company, for further answer herein denies that the plaintiff, the United States of America, has any interest in this controversy whatever; and denies that it holds the premises described in the bill of complaint, or any part thereof, in trust for the Osage Tribe of Indians; and particularly denies that it holds any part of that portion of the bed of the Arkansas River below high water mark, in Sections 6 and 7, Township 21, North, Range 8 East, in trust for the Osage Tribe of Indians; and denies that it holds or owns any oil or gas that may be found therein in trust for the Osage Tribe of Indians; and denies that the plaintiff, United States of America, has any right to receive, supervise, or in any manner interfere with the possession of said premises or any oil and gas found therein.

97 For further answer to said bill of complaint, the said Scioto Oil Company hereby consents to and approves the appointment of the supervising committee and the receiver, in pursuance to an order of the court heretofore made.

And now, having answered herein, the said defendant Scioto Oil Company prays that it be dismissed with its costs; and that the plaintiff take nothing by reason of this suit.

EDWARD H. CHANDLER,
W. A. LEDBETTER,
Attorneys for Defendant
Scioto Oil Company.

Endorsed: Filed in the District Court on August 8, 1914.

98 Cross Bill or Counter Claim of The Scioto Oil Company, a Corporation.

United States of America, Plaintiff,
No. 75. vs. In Equity.
The Brewer-Elliott Oil and Gas Company, a corporation, et al.,
Defendants.

The State of Oklahoma, ex rel, Lee Cruce, Governor, and the Commissioners of the Land Office of the State of Oklahoma, Intervenors.

The above named defendant, the Scioto Oil Company, a corporation, for its cross bill or counter claim herein alleges and shows to the court:

First:—That said corporation is incorporated under and by virtue of the laws of the State of Oklahoma, with its principal place of business in the City of Tulsa, Oklahoma, and is a citizen of said State of Oklahoma.

Second:—That the Gypsy Oil Company is a corporation duly organized under and by virtue of the laws of the State of Oklahoma, and a citizen of said State, with its principal place of business in the city of Tulsa, Oklahoma.

Third:—That as alleged by the bill of complaint filed by the United States of America as plaintiff herein, this defendant is the owner, by assignment duly executed by the Number One Oil Company, the original lessee therein, of the oil and gas lease, more specifically described in paragraph marked "ninth" of said bill of complaint, a copy of which lease for oil and gas mining purposes is duly attached to said bill of complaint, and marked "Exhibit G", which is hereby expressly referred to and made a part hereof, the same as though specifically copied into or attached to this cross bill or
99 counter claim.

Fourth:—That said Gypsy Oil Company claims to be the owner of some right, title, or interest in and to the bed of said Arkansas River below high water mark, lying in Osage and Pawnee Counties in the State of Oklahoma, in Section Six (6) and Seven (7), Township Twenty-one (21) North, Range Eight (8) East of the Indian Meridian, by virtue of some alleged or claimed oil and gas mining lease, duly executed by the Osage Nation, through its representatives and agents and approved by the Secretary of the Interior; and by virtue thereof is claiming to be the owner of and in the possession of said river bed below high water mark, and also all of Lot Five (5) of said Section Six (6) immediately adjacent to said river bed; and on or about the 12th day of June, 1914, caused to be erected a two wire fence, extending around the sides of said lot 5 north and west of said river bed and also extending up and down said river bed and connected with the other portions of said fence, so as to practically enclose all of the island and sand bars below high water mark on the Osage County side of said river bed.

Fifth:—That by virtue of the erection of said fence and maintaining of the same, said Gypsy Oil Company claims to be in the possession of said portion of said river bed to the

exclusion of this defendant and all other persons claiming any right or interest therein, and has drilled about eight wells adjacent to said Osage side of said river bed, most of which are so close to the highwater mark that they drain the oil that would otherwise remain underneath said river bed below high water mark, and is operating said wells at this time, and has been so operation them for several months last past, and has kept this defendant off of said river bed and sand bars below high water mark by virtue of said fence and armed guards patrolling the same; that this defendant, prior to the time said fence was erected or about the time of the erection of the same, had completed a producing oil 100 well upon the island or sand bar, which was an offset to one of the producing wells of the Gypsy Oil Company, and it, from the time it was completed, produced and is now producing oil in paying quantities, to wit, at an average of at least fifty barrels per day.

Sixth:—That this defendant is informed and believes that one of said wells drilled by said Gypsy Oil Company is below high water mark, and therefore in the river bed of said Arkansas River and upon the land described in its said lease above mentioned, which well, by virtue of said lease, is upon the property of and belongs to this defendant.

Seventh:—That said Gypsy Oil Company is now and has been since said fence was erected publicly asserting its ownership of said river bed and all oil and gas rights therein, by virtue of its lease upon the upland adjacent thereto from the Osage Nation, as aforesaid, and by virtue thereof has clouded the title of this defendant to said oil rights and the oil produced from its said well so drilled, so that this defendant is unable to sell the oil produced from said well and collect the proceed thereof, and will be prevented from so doing in the future as long as said claims are made by said Gypsy Oil Company, until the final termination of this action, unless a receiver is appointed by this court to take charge of said property as against the claims of said Gypsy Oil Company and all other persons parties to this action, which receiver can then operate said property and collect the proceeds of said oil, as ordered by this court.

Eighth:—That this defendant has no adequate remedy at law as against the cloud put upon its title by said Gypsy Oil Company or the claims it has publicly asserted, as all oil in paying quantities that could be produced from said river bed will be removed therefrom by the operations of the wells owned and operated by said Gypsy Oil Company on the upland

101 above high-water mark pending the final termination of this action; and it would cause a multiplicity of law suits, so that this defendant will be without any adequate or practical relief, unless it is given equitable relief, as prayed for herein.

Ninth:—That both in law and in fact said Arkansas River, at the points described in the said lease of this defendant is a navigable stream, and the title to the same became vested in the State of Oklahoma upon its erection as a State, and passed from the United States to the State of Oklahoma, which State of Oklahoma has owned said river bed below high water mark ever since Statehood, and is now the owner of the same, subject to the oil and gas rights held therein by this defendant under and by virtue of its oil and gas lease above mentioned.

Tenth:—This defendant further shows that said Gypsy Oil Company should be made a party to this suit by order of the court, in order that the rights of all parties interested in said river bed below high-water mark may be adjudicated in one action and thus prevent a multiplicity of suits; and further, that proper disposition can be made by this court, through its receiver, of the oil and gas mining operations upon said river bed and the sale of the oil heretofore and or hereafter produced therefrom, and the collection of the proceeds of said oil so produced, and the payment of the proper bills and expenses incurred by said drilling and operating of the same, all as ordered by said court.

Wherefore this defendant prays that said Gypsy Oil Company be made a defendant in this suit by order of the court herein, and ordered to appear and answer this cross bill or counter claim, but not under oath or affirmation, (answer under oath or affirmation being herein expressly waived); and that the title and claim of this defendant in and to said river bed, above described, be quieted as against the claims of said

102 Gypsy Oil Company; and that the receiver heretofore appointed by this court in this suit be placed in full charge of said river bed above described and the further drilling and operating of the same, and authorized to sell the oil and gas heretofore or hereafter produced therefrom, and collect the proceeds thereof, and to disburse the same as ordered by said court, and that this defendant and

cross complainant have and be given such other and further relief as may be equitable and just.

LEDBETTER, STUART &
BELL,
EDW. H. CHANDLER,
Attorneys for defendant and Cross
Complainant, Scioto Oil Company.

United States of America,
Western District of Oklahoma—ss.

I, Edward H. Chandler, on oath state that I am one of the attorneys for the defendant Scioto Oil Company; that I have read over the above and foregoing cross bill or counter claim, and that the statements therein contained are true, as I verily believe.

EDWARD H. CHANDLER,

Subscribed and sworn to before me on this the 8th day of September, 1914.

ARNOLD C. DOLDE,
(Seal) Clerk U. S. Dist. Court.

Endorsed: Filed in the District Court on September 9, 1914.

103 Answer of Gypsy Oil Company to Cross Bill of The
Scioto Oil Company.

The United States of America, Plaintiff,

No. 75. vs. In Equity.

The Brewer-Elliott Oil and Gas Company, a corporation;
Pawnee-Osage Oil and Gas Company, a corporation;
Chickosage Oil and Gas Company; a corporation; Num-
ber One Oil Company, a corporation; Arkansas River
Bed Oil and Gas Company, a corporation; The Scioto
Oil Company, a corporation, Defendants.

The Scioto Oil Company, a corporation, Plaintiff in Cross-
Bill

vs.

Gypsy Oil Company, a corporation, defendant in Cross-Bill

Comes now the Gypsy Oil Company, the defendant in the cross-bill or counter-claim of The Scioto Oil Company, and not waiving the manifold errors, objections and grounds of demurrer to the said cross-bill or counter-claim of The Scioto Oil Company, but reserving the same, and answering said cross-bill or counter-claim, says:

First:—That it admits that it is a corporation under the laws of the State of Oklahoma, having its principal place of business in the City of Tulsa, Oklahoma, and it is a resident of said State, as is in said bill set out and alleged; and also admits that The Scioto Oil Company is a corporation under the laws of the State of Oklahoma, having its principal place of business in the City of Tulsa, and is a citizen of the State of Oklahoma, as is in said bill alleged and set out.

Second:—Further answering said cross-bill, and especially answering the Third and Fourth paragraphs thereof, 104 this answering defendants says: That it admits that

The Scioto Oil Company claims to be the owner by assignment of the pretended oil and gas mining lease purported to have been executed by the State of Oklahoma, or its officers and agents, to the Number One Oil Company, and which said lease was pretended to be assigned and transferred in whole or in part by said Number One Oil Company to The Scioto Oil Company, as is in the original bill herein set out and alleged; and admits that the Gypsy Oil Company claims to be the owner of the right, title, interest and estate in and to the bed of said Arkansas River or low water mark where the said river runs between Osage and Pawnee counties in the State of Oklahoma, in that portion of Section six (6) township twenty-one (21) north, range eight (8) east, lying in Osage County, or what was formerly the Osage Indian Reservation by virtue of certain oil and gas mining leases duly executed by the Osage Nation through its representatives, and approved by the Secretary of the Interior, and it is in possession of said land between the high water mark and the low water mark on the Osage side of said river, and claims to have oil and gas mining leases covering said land to the center or thread of the Arkansas River, and has erected a fence on that portion of the land lying between the high water mark and low water mark of the Arkansas River on the Osage county side of the river.

Third: This defendant further answering said cross-bill, says: that it has read and is acquainted with the matters and things in the original bill filed by the United States of America in this cause against The Scioto Oil Company, together with the other defendants in said bill named, and hereby refers to said bill, and makes the second, Third, Fourth, Fifth, Sixth, Seventh, Eighth and Ninth paragraphs of said bill a part of its answer to said cross-bill to the same extent and with like purpose and effect as if each of said paragraphs were herein, in full set out;

Fourth:—Further answering said cross-bill, this answering defendant, says: That the said purported oil and gas mining lease pretended to be executed by the State of Oklahoma, or its officers and under its authority to the Number One Oil Company, and by said Number One Oil Company pretended to be assigned in whole or in part to The Scioto Oil Company, was executed without the authority of the United States of America, or the Osage Tribe of Indians, and without the consent or approval of the Secretary of the Interior, and the State of Oklahoma, nor its officers or agents, and none of its departments had any right, power or authority, under the laws of the United States of America, or under the laws of the State of Oklahoma to execute said lease covering any portion of the bed of the Arkansas River lying below the high water mark of the land described in the cross-bill herein, which was situated on the Osage side of the river, up to, and including the center or thread thereof, and that, under the laws of the State of Oklahoma, the said State, its officers and agents, and the Board of Land Commissioners only have authority to execute oil and gas mining leases on lands belonging to the State of Oklahoma, and which are school lands, or other public lands of the State of Oklahoma, and that the bed of the Arkansas River, even though the bed of said river should belong to the State of Oklahoma, is not the public lands of the state, which the state, its officers or Board of Land Commissioners have power and authority, under the laws of said state, to lease for oil and gas mining purposes, and that said State, its officers, agents and the Board of Land Commissioners thereof, did not, under the laws of said state, on the date of the pretended execution of said pretended oil and gas mining lease, have any authority or power to make and execute an oil and gas mining lease giving, or purporting to give, the Number One Oil Company, or its assignees, any right to explore or develop the bed of the Arkansas River for the discovery of oil and gas, or to extract oil and gas from any part or portion of said stream, and that the said Number One Oil Company by its said pretended oil and gas mining lease, and the said The Scioto Oil Company by its pretended assignment thereof took no right, title, interest or estate in and to the land described in said lease and assignment, and said pretended lease and assignment did not confer on either of said companies the right to enter on the land described therein, and operate and develop the same for oil and gas mining purposes;

Fifth:—Further answering said cross-bill, this answering defendant says: That it denies that the Arkansas River is in law and in fact, at the points described in the said pretended oil and gas mining lease to the Number One Oil Company, a navigable stream, and that the title of the same became vested in the State of Oklahoma upon its election as a state, and that said state has owned the bed of said river ever since statehood, but alleges the fact to be that said Arkansas River, at the point named in said pretended lease, under which the Scioto Oil Company claims, is not now, and never has been navigable in fact, and it is not now, and never has at any time prior hereto, been what is known as a navigable stream within the purview of the laws of the United States where the same runs through the Osage Indian Reservation, and that the State of Oklahoma, has never owned, and does not now own any portion of the bed of the said Arkansas River, and has no proprietary title or interest in the bed of said Arkansas River, and is wholly without power or authority to convey or confer by lease, or otherwise, any proprietary or other interest or title in and to the bed of said river, and particularly in and to that portion of the bed of said river which lies within the limits of the said Osage Indian Reservation as defined, and established by the Acts of Congress; and that, though this court should hold the said Arkansas River to be a navigable stream, then and in such event the State of Oklahoma would not have any proprietary interest or title in the bed thereof, and would be wholly without power or authority to lease the same, for oil and gas mining purposes, or for any other purpose not pertaining to the use of said stream for the purposes of navigation, and as a public highway; the
107 title and interest of the state in the navigable waters thereof being limited by law for the use and purposes of navigation and travel, and the title to the bed thereof being vested in the riparian owners of the lands along the banks of said river.

Sixth:—This defendant further answering said cross-bill, says: That on the organization of the Territory of Oklahoma, the common law became a part of the law of said territory, and was in force in said territory at the time said territory, together with what was known as the Indian Territory, was erected into the present State of Oklahoma, and the said common law was and became a part of the laws of said State of Oklahoma, and, at the time of the pretended oil and gas mining lease covering said land to the Number One Oil Company, and under said common law in force at said time in the State of Oklahoma, the riparian owners of land lying

on the Arkansas River, though said river should be held to be a navigable stream, owned and held the land to the middle or thread of said stream, and, as owners, would be entitled to extract the oil and gas from under said land in so far as the same could be extracted therefrom without interfering with the use of said stream by the public as a highway and as a means of traffic, and not interfering with the power and supervision of the Congress of the United States over the same;

Seventh:—Further answering said cross-bill, this defendant says: That, that portion of the State of Oklahoma known as Osage County, and formerly known as the Osage Indian Reservation was, by the Act of Congress creating and erecting the Territory of Oklahoma, included within the territorial limits and boundaries of said territory, and the same was and became subject to the general laws passed by the Territory of Oklahoma, and that the legislature of the Territory of Oklahoma, at its first session in the year 1890, passed

108 an Act defining the rights of riparian owners along navigable and non-navigable streams in said territory. Which Act was duly approved by the Governor of said state, and in accordance with the provisions of the organic Act of said territory and the general laws of the United States, the same was transmitted to Congress for rejection or approval, and that said Act, after being so transmitted to Congress, was not by Congress rejected, and thereupon the said Act became and was approved by Congress and became of like force and effect as if said Act of the territorial legislature of Oklahoma was, in fact, an Act of Congress; and which said Act is as follows:

“Except where the grant under which the land is held indicates a different intent, the owner of the upland when it borders upon a navigable lake or stream, takes to the edge of the lake or stream, at low water mark, and all navigable rivers shall remain and be deemed public highways. In all cases where the opposite banks of any streams not navigable belong to different persons, the stream and bed thereof shall become common to both.”

That the above Act of the territorial legislature was in force in the Territory of Oklahoma when the same, together with what is known as the Indian Territory was organized as the State of Oklahoma, and was in full force and effect in said territory and state until long after the execution of the pretended oil and gas mining lease to the Number One Oil Company, and, being in force in the Territory of Oklahoma at the time of the organization of the State of Oklahoma, said terri-

torial Act was extended over the State of Oklahoma by the schedule to the constitution, and under said Act, the State of Oklahoma declared that the owners of the lands lying along navigable waters in said state, owned said lands to the low water mark of said stream, and furnished the rule by which to construe grants from the United States to lands lying along such streams, and thereby limited the common law construction of such grants. But, if it should be held that said above

named Act is without force and effect then, on such
109 event, under the common law, grants of land lying along navigable streams should be construed as vesting title in the grantees therein to the center or thread of such streams.

Eighth:—Further answering said cross-bill, this answering defendant says: That the land described in said cross-bill lies in Osage County, Oklahoma, and is a part of what was the Osage Indian Reservation, but title thereto being vested in the Osage Nation or Tribe of Indians, or in the United States for the use and benefit of said Nation; that under the laws of the United States providing for the allotment and distribution of the lands of said Osage Tribe or Nation of Indians among the members or citizens thereof, it was expressly provided that for a specified term of years the oil and gas lying in or under said lands were reserved for the use of the Osage Tribe or Nation, and that the individual allottees of said lands, by reason of said allotment, had no right, title, interest or estate in and to said oil and gas until after the expiration of the term the same was reserved to the tribe. That on the 13th day of October, 1913, the Osage Tribe or Nation of Indians, by its principal chief, and under the authority of the tribal council of said nation, executed to the Gypsy Oil Company certain oil and gas mining leases covering subdivision One, of Lot One, of section six, township twenty-one, north range eight east, and Lot two of section six; and Lot three of said section six; and Lot four of said section six; and Lot five of said section six; and Lot seven of said section six, which leases were duly signed and executed in accordance with the laws of Congress and the rules and regulations prescribed by the Department governing and regulating the leasing of lands in the Osage Indian Reservation, now Osage county, for oil and gas mining purposes, and which said leases were duly and regularly approved by the Secretary of the Interior, and are now in full force and effect. True and correct
copies of each of said leases are hereto attached, and
110 marked "Exhibits A, B, C, D, E, and F" and made a part hereof, the same as if herein in full set out. And under and by virtue of said oil and gas mining leases, and not

otherwise, this defendant has entered on the land described in said leases for the purpose of operating and developing the same for oil and gas mining purposes in accordance with and under the provisions of said leases and the rules of the Interior Department, and is now proceeding to develop and operate the same for oil and gas mining purposes in accordance with said leases and in accordance with the rules and regulations of the Interior Department governing the same; and that that portion of said land which lies between high water mark and low water mark of the Arkansas River in Osage County, Oklahoma, it has entered on for the purpose of developing and operating the same for oil and gas mining purposes, and is now and was at the time of the commencement of this suit, and the filing of the cross-bill herein, and for a long time prior thereto, had been in possession of said land, and operating and developing the same for oil and gas mining purposes, and had fenced a portion of said land lying between the high water mark and the low water mark of said river in Osage County, and had drilled oil and gas wells thereon; but denies that it has drilled, or caused to be drilled any oil and gas well on any part of said land below the low water mark thereof; and as a fact, has not drilled any oil and gas wells on any part of said land below the ordinary high water mark thereof; and that under said leases, and under the laws of the State of Oklahoma, this defendant is entitled to the possession, use and enjoyment of the tracts of land described in each of said leases, and particularly of that portion of the land described in each of said leases which lie between the high water mark and the low water mark of the Arkansas River where said land borders thereon, and that the said The Scioto Oil Company is without any right, title, interest or estate in and to said land, or any power or authority to interfere with

111 this answering defendant in operating and developing said lands for oil and gas mining purposes, or in extracting oil therefrom, and particularly to that portion of said lands which borders on the Arkansas River, lying between the high water mark and low water mark of said stream.

And now having fully answered said cross-bill, this answering defendant prays that said bill be dismissed, and that the said The Scioto Oil Company take nothing by reason thereof.

JAMES B. DIGGS,
HENRY MCGRAW,
RUSH GREENSLADE,
Solicitors for Gypsy Oil Company.

"Exhibit A"

Oil and Gas Mining Lease, Osage Reservation,
Oklahoma.

This indenture of lease made and entered into, in quadruplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3 of the act of Congress approved June 28, 1906 (34 Stat., 539, 543), Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8, 1931, all the oil deposits and natural gas in or under the following designated subdivisions of land, of tract Five, lying and being within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision One (1) Lot One (1) of Section Six (6) T. 21 N., R. 8 E.

(Insert description in full in each case.)

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

Subdivision.....T. N.,
R. E.

of the Indian Meridian, and containing in the aggregate 24.24 acres, more or less, with the exclusive right to prospect for, extract, pipe, store and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School, at Powhuska, Okla., for the lessor, as royalty, 16-2/3 per cent of the gross proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual market value of such oil be less than sixty cents per barrel, the lessee guarantees to pay royalty based on the minimum price of sixty cents per standard barrel.

113 And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein 16-2/3 per cent of the market value of the gas at the well: Provided, That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which the lessees sell such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood

and agreed by the parties hereto that the standard rock pressure for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the second year; fifty cents per acre in advance for the third year; and one dollar per acre, per annum, in advance for the fourth and each succeeding years thereafter, it being understood and agreed that the said sums of money so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessees covenant and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depth as the oil inspector of the Osage Nation shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned by the Osage Nation by such default, shall pay to

the Superintendent of the Osage School for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand dollars (\$2,000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this lease shall be conclusive evidence of the assent of lessor and lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damage which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee's rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellation shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior shall, in his discretion, continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting

or mining operations, but such use of the surface shall be permissible only under the condition of least injury and inconvenience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all reasonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that, during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successor in interest or assignee or to the lessee of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior. 6—3384

114 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of this lease to whomsoever shall be lawfully entitled thereto, unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lessee, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing stratum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, pur-

chasers, and the whole amount of oil mined or removed and the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities thereunder as to the part surrendered: Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations made after the approval of this lease, affecting either the payments or damages thereunder shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT (Seal)

Two witnesses to execution by lessor:

Walter Brown,
P. O., Tulsa, Oklahoma.
Hugh Fitzh,
P. O., Pawhuska, Oklahoma.

Attest:
George Pettit.

GYPSY OIL COMPANY, (Seal)
By M. M. Doan, General Agent.

Two witnesses to execution by lessee:

C. E. Crawley
P. O., Tulsa, Oklahoma.

C. T. Plake,
P. O., Tulsa, Oklahoma.

Attest:
(Seal B. W. Grant, Assistant Secretary.

(3) 6—3384

Acknowledgement of Principal Chief

State of Oklahoma,
County of Comanche—ss.

Before me, Henry J. Cassin, on this 14 day of October, 1913, personally appeared Fred Lookout, to me known to be the, Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

(Seal) HENRY J. CASSIN,
Notary Public.
(Official title.)

My commission expires July 25, 1917.

115 Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public within and for the County and State aforesaid, personally appeared M. M. Doan and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan is the General Agent and B. W. Grant is the Assistant secretary of the Gypsy Oil Company, a corporation, and that the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan and B. W. Grant duly acknowledged that they each had in their said official capacities executed the foregoing instrument as the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

(Seal)

T. C. WILSON, JR.,
Notary Public.

(My commission expires October 9th, 1916.)

(5)

6—3384

116 Department of the Interior.

U. S. Indian Service,

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commissioner of Indian Affairs with recommendation that it be approved.

.....

See my report of even date.

JAMES A. CARROLL,
Supt. & Sp'l Disb'g Agt.
(Official title.)

Office of Indian Affairs,

Washington, D. C.,, 191..

Respectfully submitted to the Secretary of the Interior
with recommendation that it be approved.

C. F. HANKE,

Second Assistant Commissioner.

Washington, D. C., Oct. 29, 1913.

The within lease is approved.

LEWIS C. LAYLIN,

Assistant Secretary of the Interior.

Filed for record this day of, 191..,
at o'clockM.

6-3384

By

117

"Exhibit B"

Oil and Gas Mining Lease, Osage Reservation, Oklahoma.

This indenture of lease made and entered into, in quadruplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3 of the act of Congress approved June 28, 1906 (34 Stat., 539, 543),

Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8,

1931, all the oil deposits and natural gas in or under the following designated sub-divisions of land, of tract Five, lying and being within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision 2 Lot two (2) of Section Six (6) T. 21 N.,
R. 8. E.

(Insert description in full in each case.)

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

of the Indian Meridian, and containing in the aggregate 39.95 acres, more or less, with the exclusive right to prospect for, extract, pipe, store, and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School, at Pawhuska, Okla., for the lessor, as a royalty, 16 2/3 per cent of the gross

proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual market value of such oil be less than sixty cents per barrel, the lessee, guarantees to pay royalty based on the minimum price of sixty cents per standard barrel. 6—3384

118

2

And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein $16\frac{2}{3}$ per cent of the market value of the gas at the well: Provided, That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which the lessee sells such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood and agreed by the parties hereto that the standard rock pressure for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the second year; fifty cents per acre in advance for the third year;

and one dollar per acre, per annum, in advance for the fourth and each succeeding year thereafter, it being understood and agreed that the said sums of moneys so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessee covenants and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depths as the oil inspector of the Osage Nations shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned the Osage Nation by such default, shall pay to the Superintendent of the Osage School for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand dollars (\$2,000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this lease shall be conclusive evidence of the assent of lessor and lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each

designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damage which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellations shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior shall, in his discretion, continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting or mining operations, but such use of the surface shall be permissible only under the condition of least injury and inconvenience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all reasonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successor in interest or assignee or to the lessees of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior. 6-3504

119 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on

the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of this lease to whomsoever shall be lawfully entitled thereto, unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lease, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing startum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, purchasers, and the whole amount of oil mined or removed and the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities hereunder as to the part surrendered: Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for

the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations may after the approval of this lease, affecting either the payment or damages thereunder shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT (Seal)

Two witnesses to execution by lessor:

Wlater Brown,
P. O., Tulsa, Oklahoma.
Hugh Fitzh,
P. O., Pawhuska, Oklahoma.

Attest:
George Pettit.

GYPSY OIL COMPANY,
By M. M. Doan, (Seal)
General Agent.

Two witnesses to execution by lessee:—

C. E. Crawley,
P. O., Tulsa, Oklahoma.

C. T. Plake,
P. O., Tulsa, Oklahoma.

(Seal)

Attest:

B. W. Grant,
Assistant Secretary.

(3)

6—3384

Acknowledgment of Principal Chief.

State of Oklahoma,
County of Comanche—ss.

Before me Henry J. Cassin on this 14th day of October, 1913, personally appeared Fred Lookout to me known to be the, Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

HENRY J. CASSIN,

(Seal)

Notary Public.
(Official title.)

My commission expires July 25th, 1917.

(4)

120 Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public within and for the County and State aforesaid, personally appeared M. M. Doan and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan is the General Agent and B. W. Grant is the Assistant secretary of Gypsy Oil Company, a corporation, and the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan and B. W. Grant duly acknowledged that they each had in their said official capacities executed the foregoing instrument as

the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

T. C. WILSON, JR.

(Seal)

Notary Public.

(My commission expires October, 9th, 1916.)

(5)

6-3384

121

(6)

Department of the Interior.

U. S. Indian Service.

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commissioner of Indian Affairs with recommendation that it be approved

See my report of even date.

JAMES O. CARROLL,

Supt. Apl. Desbg. Agt.

(Official title.)

Office of Indian Affairs.

Washington, D. C.,, 191..

Respectfully submitted to the Secretary of the Interior with recommendation that it be approved

C. F. HAMPE,

Second Assistant Commissioner.

Washington, D. C., October 29, 1913.

The within lease is approved.

LEWIS C. LAYLIN,

Assistant Secretary of the Interior.

Filed for record this..... day of, 191.., at o'clock .. M.

6-3384

By

122

"Exhibit C"

Oil and Gas Mining Lease, Osage Reservation,
Oklahoma.

This indenture of lease made and entered into, in quadruplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3 of the Act of Congress approved June 28, 1906 (34 Stat., 539, 543), Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed, and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8, 1931, all the oil deposits and natural gas in or under the following designated subdivisions of land, of tract Five, lying and being within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision 3 Lot Three (3) of Section Six (6) T. 21 N.,
R. 8 E.

(Insert description in full in each case.)

Subdivision, T. N.
R. E.

Subdivision, T. N.
R. E.

Subdivision, T. N.
R. E.

Subdivision, T. N.
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision,T. N.,
R.E.

Subdivision,T. N.,
R.E.

Subdivision,T. N.,
R.E.

of the Indian Meridian, and containing in the aggregate 59.75 acres, more or less, with the exclusive right to prospect for, extract, pipe, store, and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School, at Pawhuska, Okla., for the lessor, as royalty, 16-2/3 per cent of the gross proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual value of such oil be less than sixty cents per barrel, the lessee guarantees to pay royalty based on the minimum price of sixty cents per standard barrel. 6—3384

123 And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein 16-2/3 per cent of the market value of the gas at the well: Provided, That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which lessee sells such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood and agreed by the parties hereto that the standard rock pressure

for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the second year; fifty cents per acre in advance for the third year; and one dollar per acre, per annum, in advance for the fourth and each succeeding year thereafter, it being understood and agreed that the said sums of money so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessee covenants and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depth as the oil inspector of the Osage Nation shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned the Osage Nation by such default, shall pay to the Superintendent of the Osage school for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand

dollars (\$2000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this lease shall be conclusive evidence of the assent of lessor and lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damage which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee's rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellation shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior shall, in his discretion, continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting or mining operations, but such use of the surface shall be permissible only under the condition of least injury and incon-

venience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all reasonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that, during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successors in interest or assignee or to the lessee of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior.

6—3384

124 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of this lease to whomsoever shall be lawfully entitled thereto, unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lessee, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing stratum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, purchasers, and the whole amount of oil mined or removed and

the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities thereunder as to the part surrendered: Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations made after the approval of this lease, affecting either the payments or damages thereunder shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT, (Seal)

Two witnesses to execution by lessor:

Mary Parks,
P. O., Lawton, Oklahoma.
Hugh Fitzh.
P. O., Pawhuska, Oklahoma.

Attest:

George Pettit.

GYPSY OIL COMPANY, (Seal)

By M. M. Doan, General Agent.

Two witnesses to execution by lessee:

C. E. Crawley,
P. O., Tulsa, Oklahoma.
C. T. Flake,
P. O., Tulsa, Oklahoma.

Attest:

B. W. Grant,
Assistant Secretary.

Acknowledgment of Principal Chief.

State of Oklahoma,
County of Comanch—ss.

Before me, Henry J. Cassin, on this 14th day of October, 1913, personally appeared Fred Lookout, to me known to be the, Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

(Seal)

HENRY J. CASSIN,
Notary Public.
(Official title.)

My commission expires July 25th, 1917.

125 Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public within and for the County and State aforesaid, personally appeared M. M. Doan and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan is the General Agent and B. W. Grant is the Assistant secretary of Gypsy Oil Company, a corporation, and that the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan and B. W. Grant duly acknowledged that they each had in their said official capacities executed the foregoing instrument as the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

(Seal)

T. C. WILSON, JR.

(My commission expires October 9th, 1916.

(5)

6—3384

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Department of the Interior.

U. S. Indian Service,

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commissioner of Indian Affairs with recommendation that it be approved.

.....

See my report of even date.

JAMES A. CARROLL,
Supt. & Sp'l Disb'g Agt.
(Official title.)

Office of Indian Affairs,

Washington, D. C.,, 191..

Respectfully submitted to the Secretary of the Interior with recommendation that it be approved.

.....
C. F. HANKE,

Second Assistant Commissioner.

Washington, D. C., October 29th, 1913.

The within lease is approved.

LEWIS C. LAYLIN,

Assistant Secretary of the Interior.

Filed for record this day of, 191..,
at o'clock ..M.

6-3384

.....
By

127

Exhibit "D".

Oil and Gas Mining Lease, Osage Reservation,
Oklahoma.

This indenture of lease made and entered into, in quarduplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3 of the Act of Congress approved June 28, 1906 (34 Stat., 539, 543), Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed, and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8, 1931, all the oil deposits and natural gas in or under the following designated subdivisions of land, of tract Five, lying and being

within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision 4 Lot Four (4) of Section Six (6) T. 21 N., R. 8 E.

(Insert description in full in each case.)

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

Subdivision T. N.,
R. E.

of the Indian Meridian, and containing in the aggregate 39.75 acres, more or less, with the exclusive right to prospect for, extract, pipe, store, and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School, at Pawhuska, Okla., for the lessor, as royalty, 16-2/3 per cent of the gross

proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual market value of such oil be less than sixty cents per barrel, the lessee guarantees to pay royalty based on the minimum price of sixty cents per standard barrel. 6—3384

128 And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein $16\frac{2}{3}$ per cent of the market value of the gas at the well: Provided, That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which the lessee sells such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood and agreed by the parties hereto that the standard rock pressure for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the second year; fifty cents per acre in advance for the third year;

and one dollar per acre, per annum, in advance for the fourth and each succeeding year thereafter, it being understood and agreed that the said sums of money so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessee covenants and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depth as the oil inspector of the Osage Nation shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned the Osage Nation by such default, shall pay to the Superintendent of the Osage school for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand dollars (\$2000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this lease shall be conclusive evidence of the assent of lessor and lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian

School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damage which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee's rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellation shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior shall, in his discretion, continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting or mining operations, but such use of the surface shall be permissible only under the condition of least injury and inconvenience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all reasonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that, during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successor in interest or assignee or to the lessee of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior.

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129 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of this lease to whomsoever shall be lawfully entitled thereto,

unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lessee, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing stratum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, purchasers, and the whole amount of oil mined or removed and the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities thereunder as to the part surrendered; Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations made after the approval of this lease, affecting either the payments or damages thereunder shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT, (Seal)

Two witnesses to execution by lessor:

Mary Parks,

P. O., Lawton, Oklahoma.

Hugh Fitzh.

P. O., Pawhuska, Oklahoma.

Attest:

George Pettit.

GYPSY OIL COMPANY, (Seal)

By M. M. Doan, General Agent.

Two witnesses to execution by lessee:

C. E. Crawley,

P. O., Tulsa, Oklahoma.

C. T. Plake,

P. O., Tulsa, Oklahoma.

Attest:

B. W. Grant,

Assistant Secretary.

Acknowledgment of Principal Chief.

State of Oklahoma,
County of Comanche—ss.

Before me, Henry J. Cassin, on this 14th day of October, 1913, personally appeared Fred Lookout, to me known to be the, Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

(Seal)

HENRY J. CASSIN,
Notary Public.
(Official title.)

My commission expires July 25th, 1917.

130

Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public within and for the County and State aforesaid, personally appeared M. M. Doan and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan is the General Agent and B. W. Grant is the Assistant secretary of Gypsy Oil Company, a corporation, and that the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan and B. W. Grant duly acknowledged that they each had in their said official capacities executed the foregoing instrument as the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

(Seal)

T. C. WILSON, JR.
Notary Public.

(My commission expires October 9th, 1916.

(5)

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Department of the Interior.

U. S. Indian Service,

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commissioner of Indian Affairs with recommendation that it be approved.

.....

See my report of even date.

JAMES A. CARROLL,
Supt. & Sp'l Disb'g Agt.
(Official title.)

Office of Indian Affairs,

Washington, D. C.,, 191..

Respectfully submitted to the Secretary of the Interior with recommendation that it be approved.

.....

C. F. HANKE,
Second Assistant Commissioner.

Washington, D. C., October 29th, 1913.

The within lease is approved.

LEWIS C. LAYLIN,
Assistant Secretary of the Interior.

Filed for record this day of, 191..,
at o'clock ..M.

.....,

6-3384

By

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“Exhibit E”

Oil and Gas Mining Lease, Osage Reservation, Oklahoma.

This indenture of lease made and entered into, in quadruplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal

Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3 of the act of Congress approved June 28, 1906 (34 Stat., 539,543),

Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed, and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8, 1931, all the oil deposits and natural gas in or under the following designated sub-divisions of land of tract Five, lying and being within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision 5, Lot Five (5) of Section Six (6) T. 21 N., R 8 E.

(Insert description in full in each case.)

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

Subdivision, T. N.,
R. E.

of the Indian Meridian, and containing in the aggregate 35.50 acres, more or less, with the exclusive right to prospect for, extract, pipe, store, and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School at Pawhuska, Okla., for the lessor, as royalty, 16 $\frac{2}{3}$ per cent of the gross proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual market value of such oil be less than sixty cents per barrel, the lessee guarantees to pay royalty based on the minimum price of sixty cents per standard barrel. 6—3384

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2

And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein 16 $\frac{2}{3}$ per cent of the market value of the gas at the well: Provided, That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which the lessee sells such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood and agreed by the parties hereto that the standard rock pressure for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee

shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein described, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the second year; fifty cents per acre in advance for the third year; and one dollar per acre, per annum, in advance for the fourth and each succeeding year thereafter, it being understood and agreed that the said sums of money so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessee covenants and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depth as the oil inspector of the Osage Nation shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned the Osage Nation by such default, shall pay to the Superintendent of the Osage School for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand dollars (\$2,000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this

lease shall be conclusive evidence of the assent of lessor and lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damage which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee's rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellation shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior, shall in his discretion continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting or mining operations, but such use of the surface shall be permissible only under the condition of least injury and inconvenience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all rea-

sonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that, during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successor in interest or assignee or to the lessee of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior. 6-3384

134 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of this lease to whomsoever shall be lawfully entitled thereto, unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lessee, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing stratum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, purchasers, and the whole amount of oil mined or removed and the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the

regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities thereunder as to the part surrendered: Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations made after the approval of this lease, affecting either the payments or damages there under shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT

(Seal)

Two witnesses to execution by lessor:

Mary Parks,
P. O., Lawton, Oklahoma
Walter Brown,
P. O., Tulsa, Oklahoma.

Attest:

George Pettit.

GYPSY OIL COMPANY,

By M. M. Doan [Seal]
General Agent.

Two witnesses to execution by lessee:—

C. E. Crawley,
P. O., Tulsa, Oklahoma.
O. F. Plake,
P. O., Tulsa, Oklahoma.

Attest:

B. W. Grant,
Assistant Secretary.

(Seal)

(3)

6—3384

Acknowledgment of Principal Chief.

State of Oklahoma,
County of Comanche—ss.

Before me, Henry J. Cassin, on this 24th day of October, 1913, personally appeared to me known to be the, Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

HENRY J. CASSIN,

(Seal)

Notary Public.
(Official title.)

My commission expires July 25th, 1917.

135

Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public within and for the County and State aforesaid, personally appeared M. M. Doan and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan is the General Agent and B. W. Grant is the Assistant secretary of Gypsy Oil Company, a corporation, and that the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan and B. W. Grant duly acknowledged that they each had in their said official capacities executed the foregoing instrument as the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

T. C. WILSON, JR.

(Seal)

Notary Public.

(My commission expires October 9th, 1916.

(5)

6—3384

136

6

Department of the Interior.

U. S. Indian Service.

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commisisoner of Indian Affairs with recommendation that it be approved.

.....

See my report of even date.

JAMES A. CARROLL,

Supt. Spl. Desbg. Agt.
(Official title.)

Office of Indian Affairs,
Washington, D. C.,....., 191..

Respectfully submitted to the Secretary of the Interior with
recommendation that it be approved.

.....

C. F. HANKE,
Second Assistant Commissioner.

Washington, D. C.,....., 191..

The within lease is Approved.

LEWIS C. LAYLIN,
Assistant Secretary of the Interior.

Filed for record thisday of, 191.., at
..... o'clock ..M.

.....

6-3384

By

137

Exhibit "F".

Oil and Gas Mining Lease, Osage Reservation,
Oklahoma.

This indenture of lease made and entered into, in quadruplicate, on this 13th day of October, A. D. 1913, by and between the Osage Tribe of Indians, by Fred Lookout, its principal chief, under authority conferred by the Osage Tribal Council, of the State of Oklahoma, party of the first part, hereinafter designated as lessor, and Gypsy Oil Company, a corporation, of Tulsa, Oklahoma, party of the second part, hereinafter designated as lessee, under and in pursuance of the provisions of Section 3, of the act of Congress approved June 28, 1906 (34 Stat., 539, 543), Witnesseth:

1. The lessor for and in consideration of one dollar, the receipt whereof is acknowledged, and of the royalties, covenants, stipulations, and conditions hereinafter contained, and hereby agreed to be paid, observed, and performed by the lessee, does hereby demise, grant, lease, and let unto the lessee, for the term of ten years from the date of the approval hereof by the Secretary of the Interior, and as long thereafter as oil or gas is found in paying quantities: Provided, however, That the term of this lease shall not extend beyond April 8,

1931, all the oil deposits and natural gas in or under the following designated subdivisions of land, of tract Five, lying and being within the Osage Reservation, Osage County, State of Oklahoma, described as:

Subdivision 7, Lot Seven (7) of Section Six (6) T. 21 N., R. 8 E.

(Insert description in full in each case.)

Subdivision,T.N.,
R.E.

Subdivision,T.N.,
R.E.

Subdivision,T.N.,
R.E.

Subdivision,T.N.,
R.E.

Subdivision,T.N.
R.E.

Subdivision,T.N.
R.E.

Subdivision,T.N.
R.E.

Subdivision,T.N.
R.E.

Subdivision,T.N.
R.E.

of the Indian Meridian, and containing in the aggregate 21.40 acres, more or less, with the exclusive right to prospect for, extract, pipe, store, and remove oil and natural gas, and to occupy and use so much only of the surface of said land as may be reasonably necessary to carry on the work of prospecting for, extracting, piping, storing, and removing such oil and natural gas; also the right to obtain from wells or other sources on said land, by means of pipe lines or otherwise, a sufficient supply of water to carry on said operations, and also the right to use, free of cost, oil and natural gas as light and fuel so far as necessary to the development and operation of said property.

2. The lessee hereby agrees to pay or cause to be paid to the Superintendent of the Osage Indian School, at Pawhuska,

Okla., for the lessor, as royalty, $16\frac{2}{3}$ per cent of the gross proceeds of all crude oil extracted from the said land, such royalty to be paid in money, based on the actual market value, unless the Osage National Council, with the approval of the Secretary of the Interior, shall elect to take the royalty in oil, payment to be made at the time of sale or removal of the oil. It is understood and agreed, however, that should the actual market value of such oil be less than sixty cents per barrel, the lessee guarantees to pay royalty based on the minimum price of sixty cents per standard barrel. 6—3384

2

138 And the lessee agrees to pay as royalty on each gas-producing well utilized otherwise than as provided herein $16\frac{2}{3}$ per cent of the market value of the gas at the well; Provided: That should either the Osage National Council or the Secretary of the Interior be of the opinion that the price at which the lessee sells such gas is not the true market value at the well, the Secretary of the Interior shall, after notice and hearing, determine the market value and the lessee shall account to the lessor at the rate fixed by the Secretary of the Interior as aforesaid. The lessee shall establish meters at its expense to measure the supply of gas received from the leased premises, and the accounting shall be on the basis of the supply as shown by such meter statements. It is understood and agreed by the parties hereto that the standard rock pressure for the sale of gas from this lease shall be two pounds. The Osage Nation shall have the right to the free use of gas for school and public buildings of the Osage Nation from any well or wells that may be discovered on the leased lands: Provided, That no expense shall be incurred by the lessee in piping gas for such purposes, and the lessee shall not be required to pay royalty on such gas. Failure on the part of the lessee to use a gas-producing well, which can not profitably be utilized at the rate herein prescribed, shall not work a forfeiture of this lease so far as the same relates to mining oil, but if the lessee desires to retain gas-producing rights or privileges, lessee shall pay a rental of one hundred dollars per annum in advance on each gas-producing well, the gas from which is not marketed or not utilized otherwise than for operations under this lease, and the same shall be credited on gas royalties due and payable if during the year for which advance gas royalties are paid lessee elects to market the gas.

3. The lessee shall pay to the officer in charge, as advance annual rental on this lease, fifteen cents per acre in advance for the first year; thirty cents per acre in advance for the

second year; fifty cents per acre in advance for the third year; and one dollar per acre, per annum, in advance for the fourth and each succeeding years thereafter, it being understood and agreed that the said sums of money so paid during any year in which royalties on production are payable, shall be a credit on the stipulated royalties due from the lessee if such royalties on production exceed the advance annual rental for that year.

4. The lessee covenants and agrees to commence to drill at least one well on every leased designated subdivision within ninety days and to complete such well or wells within one year from the date of the approval of this lease by the Secretary of the Interior. After the drilling of a well is commenced the drilling operations shall be conducted with due and reasonable diligence until such well is completed or is drilled to such depth as the oil inspector of the Osage Nation shall deem reasonable. In addition to forfeiture in the sole discretion of the Secretary of the Interior of the lease for failure to drill and complete the required test well or test wells on each and every designated subdivision as aforesaid, within the time provided by this lease and the regulations relating thereto, the lessee and its surety, by reason of the impossibility of accurately determining the amount of damages which will be occasioned the Osage Nation by such default, shall pay to the Superintendent of the Osage School for the use and benefit of the lessor, as and for liquidated damages and not as a penalty, the sum of two thousand dollars (\$2,000) for each and every test well required to be drilled and not completed within one year from the date of approval of this lease by the Secretary of the Interior, and the execution of this lease shall be conclusive evidence of the assent of lessor or lessee to liquidated damages in the sum of two thousand dollars (\$2,000) per well for defaults within the time limit named herein. The lessee, after having drilled and completed the test well or wells required to be drilled and completed, may release and surrender all the land covered by the lease, or any designated subdivision thereof, or such sections of 640 acres of any designated subdivision as he may elect, on the payment of all rentals and royalties due on the date of such surrender, as provided in paragraph 8 of this lease. Should the lessee elect to hold the lease or any designated subdivision thereof exceeding in area 2,560 acres after the period of one year allowed for the drilling of one test well on each designated subdivision has expired, it shall drill and complete at least one additional test well on each designated subdivision exceeding in area 2,560 acres within one year from and after the date of expiration

of the time allowed for the drilling and completion of the first test well, or in default thereof, shall pay to the Superintendent of the Osage Indian School for the use and benefit of the Osage Nation, by reason of the impossibility of determining the amount of damages which will be occasioned to said Nation on account of failure to drill such second test well as aforesaid, the sum of two thousand dollars (\$2,000), as and for liquidated damages and not as a penalty, for each second test well for which the lessee may be in default, in addition to any and all other payments required by the regulations and the terms of this lease. Failure on the part of the lessee to comply strictly with the provisions of this paragraph shall constitute a violation of one of the substantial terms and conditions of this lease and shall operate as a forfeiture of the lessee's rights and subject the lease to cancellation in the discretion of the Secretary of the Interior; but such forfeiture and cancellation shall not operate to relieve or release the lessee and surety from the payment of liquidated damages as herein provided for, even though the Secretary of the Interior shall, in his discretion, continue the lease in force and effect.

5. The lessee may use so much of the surface of the land as may be reasonably necessary for prospecting and mining operations required by this lease, and shall also have the right of way over and across such land to any point of prospecting or mining operations, but such use of the surface shall be permissible only under the conditions of least injury and inconvenience to the allottee and owner of the land. Lessee before commencing and during such operations shall pay all reasonable damages for the use of such surface of the land and to any growing crops thereon or to any improvements on such land or any damages that, during the life of this lease, shall be occasioned in any manner whatsoever to the allottee or his successor in interest or assignee or to the lessee of the surface of the land by the use of the surface, such damages to be apportioned among the parties interested in the surface, whether as owners, lessees, or otherwise, as such parties may mutually agree or as their interests may appear: Provided, That when the damages can not be agreed upon between the parties in interest, the amount of such damage shall be determined in accordance with the regulations approved by the Secretary of the Interior. 6—3384

139 6. The lessee shall carry on development and operations in a workmanlike manner, commit no waste on the said land, suffer none to be committed upon the portion in its occupancy or use; take good care of the same and promptly surrender and return the premises upon the termination of

this lease to whomsoever shall be lawfully entitled thereto, unavoidable casualties excepted; shall not remove therefrom any buildings or permanent improvements erected thereon during the said term by the said lessee, but said buildings and improvements shall remain a part of said land and become the property of the owner of the surface of the land, excepting the tools, derricks, boilers, boiler houses, pipe lines, pumping and drilling outfits, tanks, engines, and machinery, and the casing of all dry or exhausted wells, which shall remain the property of the lessee, and may be removed at any time prior to sixty days after the termination of the lease by forfeiture or otherwise, provided the payments agreed upon by this lease and the regulations applicable thereto have been made to the lessor, but not otherwise; shall not permit any nuisance to be maintained on the premises under lessees control, nor allow any intoxicating liquors to be sold or given away for any purposes on such premises; shall not use such premises for any other purpose than those authorized in this lease; and before abandoning any well shall securely plug the same so as effectually to shut off all water from the oil-bearing stratum, as provided in the regulations prescribed by the Secretary of the Interior.

7. The lessee shall keep an accurate account of all oil and gas mining operations, showing the sales, prices, dates, purchasers, and the whole amount of oil mined or removed and the quantity of gas sold and the gross receipts derived therefrom, and shall make sworn reports thereof as required by the regulations and all sums due as royalty, advance rental, liquidated or surface damages, shall be a lien on all implements, tools, movable machinery, and all other personal chattels used in operation upon said property, and upon all of the unsold oil obtained from the land herein leased, as security for payment of said sums.

8. The lessee may at any time, by paying to the Indian Superintendent all amounts then due as provided herein, and the further sum of one dollar, surrender all or any part of the land covered by this lease and have the lease canceled as to the land surrendered and be relieved from all further obligations and liabilities thereunder as to the part surrendered; Provided, That in the event the lease is surrendered for cancellation in whole or in part after a new lease year has been entered upon, the lessee and the surety shall be held liable for the advance rentals required to be paid for that year, and no part of such rentals which may have been paid shall be refunded.

9. This lease shall be subject to the regulations of the Secretary of the Interior, now or hereafter in force, relative to such leases, all of which regulations are made a part and condition of this lease: Provided, That no regulations made after the approval of this lease, affecting either the payments or damages thereunder shall operate to affect the terms and conditions of this lease.

10. Upon the violation of any of the terms and conditions of this lease, the Secretary of the Interior shall have the right at any time after thirty days' notice to the lessee, specifying the terms or conditions violated, to declare this lease null and void.

11. Before this lease shall be in force and effect the lessee shall furnish a bond with responsible surety to the satisfaction of the Secretary of the Interior, conditioned for the performance of this lease, which bond shall be deposited and remain on file in the Indian Office.

12. Assignment of this lease or any interest therein may be made with the approval of the Secretary of the Interior and not otherwise.

13. Each and every clause and covenant of this indenture shall extend to the heirs, executors, administrators, successors, and lawful assigns of the parties hereto.

In Witness Whereof, the said parties have hereunto subscribed their names and affixed their seals on the day and year first above mentioned.

FRED LOOKOUT, (Seal)

Two witnesses to execution by lessor:

Mary Parks,
P. O., Lawton, Oklahoma,
Walter Brown,
P. O., Tulsa, Oklahoma,

Attest:

George Pettit,

GYPSY OIL COMPANY, (Seal)

By M. M. Doan, General Agent.

Two witnesses to execution by lessee:

C. E. Crawley,
P. O., Tulsa, Oklahoma,
C. T. Plake,
P. O., Tulsa, Oklahoma,

Attest:

B. W. Grant,
(Seal) Assistant Secretary.

(3)

6—3384

Acknowledgment of Principal Chief.

State of Oklahoma,
County of Comanche—ss.

Before me, Henry J. Cassin, on this 14th day of October, 1913, personally appeared Fred Lookout, to me known to be the Principal Chief of the Osage Nation and the identical person who executed the within and foregoing lease, and acknowledged to me that he executed the same as his voluntary act and deed on behalf of the Osage Nation and in accordance with the authority given him by the Osage National Council.

(Seal)

HENRY J. CASSIN,
Notary Public.
(Official title.)

My commission expires July 25th, 1917.

(4)

140

Acknowledgment of Corporation.

State of Oklahoma,
County of Tulsa—ss.

On this 13th day of October, A. D. 1913, before me, a Notary Public, within and for the County and State aforesaid, personally appeared M. M. Doan, and B. W. Grant, to me personally known, who being by me duly sworn, did each say that M. M. Doan, is the General Agent, and B. W. Grant, is the Assistant secretary of, a corporation, and that the seal affixed to the foregoing and annexed instrument is the corporate seal of said corporation, and that said instrument was signed and sealed in behalf of said corporation by authority of its board of directors; and said M. M. Doan, and B. W. Grant, duly acknowledged that they each had in their said official capacities executed the foregoing instrument as the act and deed of the said company for the consideration and purposes therein mentioned and set forth.

Witness my hand and official seal this 13th day of October, 1913.

(Seal)

T. C. WILSON, JR.,
Notary Public.

(My commission expires October 9th, 1916.

(5)

6—3384

6

141 Department of the Interior.

U. S. Indian Service,

Osage Agency,

Pawhuska, Oklahoma, October 14, 1913.

The within lease is forwarded to the Commissioner of Indian Affairs with recommendation that it be approved.

See my report of even date.

JAMES A. CARROLL,
Supt. & Sp'l. Disb'g Agt.
(Official title.)

Office of Indian Affairs,

Washington, D. C., 191...

Respectfully submitted to the Secretary of the Interior with recommendation that it be approved.

C. F. HANKE,
Second Assistant Commissioner.

Washington, D. C., October 29th, 1913.

The within lease is approved.

LEWIS C. LAYLIN,
Assistant Secretary of the Interior.

Filed for record this day of 191...,
at o'clockM.

6—3384

By

142 Endorsed: Answer of the Gypsy Oil Company: Filed
October 10, 1914.

143 (Stipulation as to certain Evidence.)

United States of America, Plaintiff,
vs.

Brewer-Elliott Oil & Gas Company, et al., Defendants.

State of Oklahoma, Intervenor.

It is hereby stipulated and agreed by and between the parties to the above entitled cause, as follows, to-wit:

1. That any part of the testimony contained in the record on appeal in the Supreme Court of Oklahoma in the case of State of Oklahoma vs. Nolegs, decision reported in 139 Pac. 943 and in the record in the Supreme Court of the United States in case of Kansas vs. Colorado, decision reported in 206 U. S. 46, so far as the same may be material or relevant to the issue of the navigability of the Arkansas River in this case, may be read as evidence on the final hearing hereof by any party hereto, and admitted by the court to the same extent and with same effect as if the witnesses who testified in those cases were present and testifying in this case.

2. That all of the evidence concerning the issue of the navigability of the Arkansas River received on the final hearing of either of the other cases now pending in the United States District Court of the Eastern District of Oklahoma and the United States District Court of the Western District of Oklahoma, in which that issue is involved, and to which the United States and the State of Oklahoma are parties, namely: No. 1733 Equity, United States of America vs. Phillip Mackey, et al., and No. 2025 Equity United States of America vs. Cimarron River Bed Oil and Gas Company, et al., in the Eastern District of the State of Oklahoma, and No. 839 Equity, United States of America vs. G. W. Hutchings, et al., in the Western District, may be considered on
144 the final hearing of this cause to the same extent and with the same effect as if the same had been received into this cause.

In testimony whereof we have hereunto set our hands this
..... day of August, 1915.

JOHN A. FAIN,
United States Attorney for the West-
ern District of Oklahoma and Attorney
for Complainant.

LEDBETTER, STUART & BELL,
Attorneys for Brewer-Elliott Oil & Gas
Co., Pawnee-Osage Oil & Gas Co.,
Chickosage Oil and Gas Co., Number
One Oil Co., Scioto Oil Co., Defendants.

BLAKE & BOYS,
Attorneys for Arkansas River Bed Oil
& Gas Co.

S. P. FREELING,
Atty. Genl. Atty. for State of Oklahoma.

BIDDISON & CAMPBELL,
Attys. for Edmiston, Defendant.

JAMES B. DIGGS,
Attorney for Gypsy Oil Co.

Endorsed: Filed in the District Court on December 6,
1915.

145 (Stipulation between The Gypsy Oil Company and The
 Scioto Oil Company as to wells drilled, etc.)

Whereas the Gypsy Oil Company is the owner of an oil
and gas mining lease on,

Section Six (6), Township Twenty-one (21) North, Range
Eight (8), East, in Osage County, Oklahoma.

and claims that said lease extends to the low water mark or
center of the Arkansas River; and

Whereas, The Scioto Oil Company is operating an oil and
gas mining lease executed by the Commissioners of the Land
Office of the State of Oklahoma to the bed of the Arkansas
River, adjacent to and adjoining the land above described;
and

Whereas, the Gypsy Oil Company claims that its lease ex-
tends to the center of the Arkansas River, or at least to the
low water mark of the Arkansas River, and The Scioto Oil
Company claims that the State is owner of the bed of the
River below high-water mark; and

Whereas, the Gypsy Oil Company and the Scioto Oil Company have each drilled wells on the land it claims to be covered by their respective leases, and the ownership of such wells depends or may depend on whether they have drilled above or below high water mark or above or below low water mark of the Arkansas River;

Now, Therefore, It is hereby agreed and stipulated between the parties hereto that, for all purposes of this cause, the wells drilled by the Gypsy Oil Company are above the ordinary high water mark of the Arkansas River, and all the wells drilled by the Scioto Oil Company are below the ordinary high water mark of said river.

It is further agreed and stipulated between the parties hereto that, if the court in this cause shall determine that the State owns the bed of the Arkansas River below ordinary high water mark, then decree shall be entered subject to the right of appeal, quieting the title of the Scioto Oil Company to its lease and barring the Gypsy Oil Company from any interest therein, and, if it shall be finally determined that the Gypsy Oil Company's lease extends to the low water mark of center of said stream, then, subject to the right of appeal, decree shall be entered so establishing the rights of the Gypsy Oil Company; that is to say: In event the court finds the Arkansas River is a navigable stream, and the State owns the bed of said stream below ordinary high water mark, then decree shall be entered in favor of the Scioto Oil Company, and, if it shall decide that the State does not own the bed of the Arkansas River, then decree shall be entered in favor of the Gypsy Oil Company and against the Scioto Oil Company.

It is further agreed and stipulated between the parties hereto that, so far as the land above described is concerned, the receiver heretofore appointed in this cause for the working interest may be discharged without cost to the Gypsy Oil Company, each of the parties hereto being fully satisfied as to the financial responsibility of each other, and to look to such responsibility for compensation of any injury it may sustain

140 BREWER-ELLIOTT OIL AND GAS CO., A CORP., ET AL. VS.

by reason of the possession or development of any portion of the above described land.

147 Witness our hands this 8th day of December, 1916.

GYPSY OIL COMPANY,

By James B. Diggs, Its Atty.

THE SCIOTO OIL COMPANY,

By Edw. H. Chandler, W. A. Ledbetter,
Attorneys.

Endorsed: Filed in the District Court on December 26, 1916.

148 Motion for Discharge of Receiver in Accordance with Stipulation Between Gypsy Oil Company and Scioto Oil Company.

Now comes the Scioto Oil Company and respectfully presents for the consideration of the court a stipulation made and entered into on December 8th, 1916, by and between the Gypsy Oil Company, and the Scioto Oil Company, wherein the issues arising between them upon their pleadings are composed and settled and agreeing that as between themselves the Receiver heretofore appointed in said cause may be dismissed:

Wherefore, the Scioto Oil Company moves the court that said Receiver be discharged so far as the operation of the oil and gas lease under which the Scioto Oil Company claims herein may be concerned, but that the court make proper provision in said order of dismissal for the payment of all debts and obligations incurred by the Receiver, and for the payment of the royalty provided to be paid in said lease under which said Scioto Oil Company claims to the party ultimately adjudged to be the owner thereof.

W. A. LEDBETTER,

EDW. H. CHANDLER,

Attorneys for Scioto Oil Company.

Endorsed: Filed in the District Court on December 26, 1916.

149

150 (Order, discharging Receiver as to the Scioto Oil Company Lease, etc.)

On this 5th day of January, 1917, the above styled cause came on to be heard upon the motion of the Scioto Oil Com-

pany, to discharge and vacate the order made in this cause on September 9th, 1914, whereby Frank H. McGuire, Receiver, was authorized and empowered to operate the oil and gas lease held by the Scioto Oil Company on the following described premises, towit:

All the portion of the bed of the Arkansas River below the high water mark in Sections Six (6) and Seven (7) Township twenty-one (21) North, Range Eight (8) East of the Indian Meridian.

Thereupon, the United States of America appeared by John A. Fain, United States Attorney, the State of Oklahoma and Commissioners of the land office appeared by Guy F. Nelson, Assistant Attorney General and Scioto Oil Company appeared by W. A. Ledbetter, its attorney, and the said attorney of the Scioto Oil Company presented for the consideration of the court the stipulation of the Scioto Oil Company and the Gypsy Oil Company, whereby they agreed to the discharge of said receiver insofar as the operation of the oil and gas lease was concerned.

And the court, after being fully advised in the premises, is of the opinion that said motion should be granted.

Wherefore, it is ordered, adjudged and decreed by the court that on the 15th day of January 1917, Frank H. McGuire shall cease the operation of said lease and deliver to the Scioto Oil Company or its successor or assign the possession thereof together with all wells drilled thereon, and all equipment of every kind and character connected therewith subject to the rights and powers of the receiver as hereinafter provided. But that thereafter, the said Scioto Oil Company shall operate said lease in all respects in accordance with the provisions and requirements of the order of this court made herein on the 15th day of June, 1914, and that said order of the 15th day of June, 1914, shall continue in force and effect as to the operation of said lease, and that thereafter, the said Frank H. McGuire shall continue to exercise all the duties and powers therein conferred upon him as such receiver, and thereafter collect and hold as therein provided, the royalty and bonus therein specified from the oil and gas produced on the premises above described.

It is further ordered, adjudged and decreed by the court that the said Gypsy Oil Company be, and it is hereby enjoined until the further order of this court, from in any manner interfering with the operation of said premises for oil and gas purposes.

It is further ordered, adjudged and decreed by the court that the said Frank McGuire, on or before the 15th day of January, 1917, shall file in this court a full and complete report of all moneys received by him during the time he has operated said lease as receiver under the provisions of said order of September 9th, 1914, together with all disbursements made by him during the operation of said lease up to and including the said 15th day of January, 1917, and that he shall include in the money received by him the runs from the wells on said lease up to the 1st day of January, 1917, and that thereafter he shall receive the rate of royalty and bonus provided for in said order of June 15th, 1914, but that all other proceeds of said oil lease, commonly known as the working interest, shall, from and after said 1st day of January 1917, be received by, be and become the property of Scioto Oil Company, as provided in said original order of June 15th, 1914.

152 And the said receiver is further ordered and decreed to file in this court a full and complete inventory of all equipment on said lease and to take the receipt of the said Scioto Oil Company therefor as of the date of January 15th, 1917.

JOHN H. COTTERAL,

Judge.

O. K.

John A. Fain, U. S. Atty.

O. K.

Guy F. Nelson, Asst. Atty, Genl.
W. A. Ledbetter.

Endorsed: Filed in the District Court on January 5, 1917.

153 Motion of C. J. Haskell to be made a Party Defendant.

Now comes C. J. Haskell and respectfully shows to the court that he has an interest in the subject matter of this suit in that heretofore, to-wit: On the 15th day of January, 1917, he became the owner of, and now is the owner of the oil and gas lease heretofore executed by the Commissioners of the Land Office covering the bed of the Arkansas River in Sections 6 and 7, Twp. 21 North, Rng. 8 East, I. M. and that he is now operating said lease under and in accordance with the orders of the court heretofore made in the above styled cause and in accordance with the provisions of said lease.

Wherefore the said C. J. Haskell prays that he may be made a party defendant herein.

LEDBETTER, STUART & BELL,
Attorneys for C. J. Haskell.

Endorsed: Filed in the District Court on February 21, 1918.

154 (Order, March 15, 1918, making C. J. Haskell a party defendant.)

On this the 15th day of March 1918, appeared in open court W. A. Ledbetter, and presented to the court the motion of C. J. Haskell to be made a party defendant herein, and requested that he be permitted to file said motion, together with the answer of said C. J. Haskell, and upon consideration of the matter,

It is hereby ordered that said motion be granted and that the said motion and said answer be filed herein as of the 21 day of February, 1918.

JOHN H. COTTERAL,
Judge.

Endorsed: Filed in the District Court on March 15, 1918.

155 Answer of the Defendant C. J. Haskell.

1. Now comes the defendant C. J. Haskell, and after having obtained leave of the court files this his answer herein and denies that the complainant, the United States of America or the Osage Tribe of Indians is the owner of the premises described in the bill of complaint herein, or the oil and gas produced therefrom, but alleges that the State of Oklahoma is the owner of said premises, and subject to the provisions of the leases executed by the State of Oklahoma as set forth in said bill of complaint and that said State of Oklahoma is the owner of the oil and gas produced therefrom, and particularly the owner of the royalty provided to be paid in said leases.

2. For further answer the said bill of complaint, this defendant alleges and charges that heretofore, to-wit: on the 1st day of October, 1913, the Commissioners of the Land Office executed to the Number One Oil Company, a corporation, an oil and gas lease covering the following described land, to-wit: All that portion of the bed of the Arkansas River below high water mark in Sections 6 and 7, Twp. 21 North, Rng. 8 East,

I. M. and that on the 10th day of November, 1913, the said Number One Oil Company, by written assignment, transferred, assigned and delivered said lease to the Scioto Oil Company in so far as the same covers the above described
 156 property. That heretofore, to-wit, on the day of 19.. the said Scioto Oil Company, a corporation, transferred and assigned said lease to the Okla Oil Company, likewise a corporation, and that thereafter, towit; on the 15th day of January, 1917, said Okla Oil Company, whose name in the meantime had been changed to the Tidal Oil Company, transferred and assigned said leases to this defendant, C. J. Haskell, all of which assignments have been duly approved and consented to by the Commissioners of the Land Office, and that this defendant is now the owner of said lease and is operating the same under the provisions of the orders of this court and in accordance with the terms and provisions of said lease.

3. For further answer this defendant hereby adopts each and all of the allegations contained in the answers and other pleadings herein filed by the defendants, Number One Oil Company, Scioto Oil Company and the said Okla or Tidal Oil Company, and the said defendant C. J. Haskell further adopts all of the evidence offered on the trial of said cause by the said Number One Oil Company, Scioto Oil Company and the Okla or Tidal Oil Company, and the said defendant likewise adopts the prayer in the answers of said defendants and now prays that on final determination of this cause, said lease, together with each and all of the assignments above referred to, be held to be valid and binding and that he be entitled to all the relief prayed for in said several answers, and particularly that he be entitled to hold and operate said lease and to appropriate to his own use and benefit all of the oil and gas produced therefrom, or what is known as the working interest, the royalty provided to be paid in said lease be impounded by the court as provided in said orders, until the final determination of this suit, and that this defendant have all other relief, both general and special, to which he may be entitled.

LEDBETTER, STUART & BELL,
 Attys. for defendant C. J. Haskell.

157 Endorsed: Filed in the District Court on February 21, 1918.

158 (Order of Submission, January 1, 1916.)

The United States, Plaintiff,
No. 839. vs.
G. W. Hutchings, et al., Defendants.

The United States, Plaintiff.
No. 75. vs.

Brewer-Elliott Oil & Gas Company, et al., Defendants

Now on this 1st day of January 1916, this cause comes on for further hearing and parties are present by counsel as heretofore.

Thereupon further argument of counsel are heard and concluded, and it is thereupon

Ordered, that the causes above entitled be and the same are hereby submitted to the court for determination.

It is further ordered that the plaintiff have twenty days from this date in which to file briefs herein, and the defendants are granted twenty days thereafter in which to file reply briefs.

And now at this time comes John J. Carney, Esq., and asks and obtains leave to file herein within twenty days, a brief on behalf of parties interested but who are not parties to this suit.

160 (Statement of the Evidence.)

Lodged in Clerk's office this 20th day of January, 1919.

ARNOLD C. DOLDE, Clerk.

By Frank T. McCoy, Deputy.

Filed in the U. S. District Court, May 5, 1919.

161 The United States of America, Plaintiff,
No. 75. vs.

The Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chick-osage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; the Scioto Oil Company, a corporation; the Gypsy Oil Company, a corporation, and C. J. Haskel, Defendants.

Be It Remembered that the testimony hereinafter set forth is all the testimony essential to the decision of the questions

presented by the appeals in this case, the parts of the testimony not essential to the decision of said questions being omitted.

162 The Government referred the court to the treaty of July 8, 1817, 7 Stat. 156, 2 Capper 288, by which the United States, through Congress, gave to the Cherokee Indians a specific tract of country west of the Mississippi River, containing seven million acres of land.

The Government here referred the court to the Act of May 28, 1830, 4 Stat. 411.

The Government called the attention of the court to treaty of February 14, 1833, 7 Stat. 414, 2 Capper 385, by which the boundaries of the seven million acres above referred to were changed so as to avoid conflict with lands which had been granted to the Creeks.

The Government next called the court's attention to treaty of December 29, 1835, 7 Stat. 478, 2 Capper 439, by which the Cherokee ceded to the United States all their lands east of the Mississippi, the boundaries of the seven million acres and the outlet under treaties of 1820 and 1838 were confirmed and eight hundred thousand acres more were granted to the Cherokees, all to be conveyed by patent.

The Government here offered in evidence a certified copy of said patent, Exhibit I, which reads:

163 The United States of America, To all to whom these presents shall come,—Greeting:

Whereas by certain treaties made by the United States of America with the Cherokee nation of Indians of the sixth of May, one thousand eight hundred and twenty eight, the fourteenth of February, one thousand eight hundred and thirty three, and the [twenth] ninth of December one thousand eight hundred and thirty five, it was stipulated and agreed on the part of the United States, that in consideration of the premises mentioned in the said treaties, respectively, the United States should guaranty, secure and convey, by patent, to the said Cherokee nation, certain tracts of land; the description

of which tracts and the terms and conditions on which they were to be conveyed, are set forth in the second and third articles of the treaty of the twenty ninth of December, one thousand eight hundred and thirty five in the words following, that is to say: "Article 2nd, Whereas, by the treaty of May sixth, one thousand eight hundred and twenty eight, and the supplementary treaty thereto of February fourteenth, one thousand eight hundred and thirty three, with the Cherokee west of the Mississippi, the United States guaranteed and secured to be conveyed by patent to the Cherokee Nation of Indians, the following tract of Country; Beginning at a point on the old western territorial line of Arkansas territory, being twenty five miles north from the point where the territorial line crosses Arkansas river; thence running from said north point south on the said territorial line, where the said territorial line crosses Verdigris river; thence down said Verdigris river to the Arkansas; thence down said Arkansas to a point where a stone is placed opposite the east or lower

bank of Grand river; at its junction with the Arkansas;
164 thence running south forty four degrees west one mile;

thence, in a straight line, to a point four miles northerly from the mouth of the north fork of the Canadian; thence, along the said four mile line to the Canadian; thence down the Canadian to the Arkansas, thence down the Arkansas to that point on the Arkansas where the eastern Choctaw boundary strikes said river and running thence with the western line of Arkansas territory as now defined, to the south west corner of Missouri; thence, along the Western Missouri line to the land assigned the Senecas; thence, on the south line of the Senecas to Grand river; thence, up said Grand river, as far as the south line of the Osage reservation extended, if necessary; thence up and between said South Osage line extended west if necessary, and a line drawn due west from the point of beginning to a certain distance west, at which a line running north and south from said Osage line to said due west line, will make seven millions of acres within the whole described boundaries. In addition to the seven millions of acres of land thus provided for and bounded, the United States further guaranty to the Cherokee Nation a perpetual outlet west, and a free and unmolested use of all the Country west of the western boundary of said seven millions of acres, as far west as the sovereignty of the United States and their right of soil extend, provided however, that if the Saline or Salt plain on the Western prairie shall fall within said limits prescribed for said outlet, the right is reserved to the United States to permit other tribes of red men to get salt on said

plain, in common with the Cherokees. And letters patent shall be issued by the United States as soon as practicable for the land hereby guaranteed. And whereas it is apprehended by the Cherokees that in the above cession there is not contained a sufficient guaranty of land for the accommodation of the whole nation, on their removal west of the Mississippi, the United States, in consideration of the sum of five hundred thousand dollars, therefore hereby covenant and agree to convey to the said Indians and their descendants, by patent, in fee simple, the following additional tract of land situated between the the west line of the State of Missouri and the Osage reservation, beginning at the Southeast corner of the same, and runs north along the east line of the Osage lands fifty miles, to the northeast corner thereof; and thence east to the west line of the State of Missouri, thence with said line south fifty miles; thence west of the place of beginning; estimated to contain eight hundred thousand acres of land but it is expressly understood, that if any of the lands assigned the Quapaws shall fall within the aforesaid bounds, the same shall be reserved and excepted out of the lands above granted, and a prorata reduction shall be made in the price to be allowed to the United States for the same by the Cherokees." Article 3rd: The United States also agree, that the lands above ceded by the Treaty of February fourteenth, one thousand eight hundred and thirty three, including the outlet, and those ceded by the treaty, shall all be included in one patent, executed to the Cherokee Nation of Indians by the President of the United States according to the provisions of the Act of May twenty eight, one thousand eight hundred and thirty. It is however, agreed, that the military reservation at Fort Gibson shall be held by the United States. But should the United States abandon said post and have no further use for the same, it shall revert to the Cherokee nation. The United States shall always have the right to make and establish such post and military roads and forts in any part of the Cherokee Country, as they may deem proper for the interest and protection of the same; and the free use of as much land timber fuel and materials of all kinds, for the construction and support of the same, as may be necessary; provided that if the private rights of individuals are interfered with a just compensation therefor shall be made."

And whereas, the United States have caused the said tract of seven millions of acres together with the said perpetual out-

let, to be surveyed in one tract, the boundaries thereof are as follows:

- 166 Beginning at a mound of rocks four feet square at base and four and a half feet high, from which another mound of rocks bears South one chain, and another mound of rocks bears west one chain, on what has been denominated the old western territorial line of Arkansas Territory; twenty five miles north of Arkansas river; thence south twenty one miles and twenty eight chains, to a position the South east bank of the Verdigris river, from which a hackberry, fifteen inches diameter, bears Courth sixty one degrees thirty one minutes east., forty three links, marked C. H. L. and a Cottonwood forty two inches diameter bears south twenty one degrees, fifteen minutes, east fifty links marked C. R. K. L., thence down the Verdigris river, on the north east bank, with its meanders, to the junction of Verdigris and Arkansas rivers, thence from the lower bank of Verdigris river, on the North bank of Arkansas river south forty four degrees, thirteen minutes, east, fifty seven chains, to a post on the sough bank of Arkansas, opposite to the eastern bank of Neosho river, at its junction with Arkansas, from which a red oak, thirty six inches diameter, bears South seventy five degrees, forty five minutes west, twenty four links and a hickory twenty four inches diameter, bears south eighty nine degrees east, four links; thence South fifty three degrees west, one mile to a post, from which a rock bears north fifty three degrees east, fifty links and a rock bears south eighteen degrees, eighteen minutes west fifty links; thence south eighteen degrees eighteen minutes west thirty three miles twenty eight chains and eighty links, to a rock from which another rock bears north, eighteen degrees, eighteen minutes east fifty links and another rock bears south fifty links; thence south four miles, to a post on the lower bank of the north fork of Canadian river, at its junction with Canadian river, from which a Cottonwood, twenty four inches diameter, bears north eighteen degrees east, forth links, and a Cottonwood fifteen inches diameter, bears south nine degrees east fourteen links; thence down the Canadian river, on its North bank, to its junction with
- 167 Arkansas river; thence down the main channel of Arkansas river, to the western boundary of the State of Arkansas, at the northern extremity of the astern boundry of the lands of the Choctaws, on the south bank of Arkansas river four chains and fifty four links, east of Fort Smith; thence north seven degrees, twenty five minutes west, with the western boundary of the State of Arkansas, seventy six

miles, sixty four chains and fifty links to the Southwest corner of the State of Missouri eight miles, forty nine chains and fifty links to the north bank of Cowskin or Seneca river at a mound six feet square at base, and five feet high, in which is a post marked on the south side Cor. n. Ch. L. dl thence west on the southern boundary of the lands of the Senecas, eleven miles and forth eight chains to a post on the east bank of Neosho river, from which a maple, eighteen inches in diameter, bears south thirty one degrees east, seventy two links; thence up Neosho river, with its meanders, on the east bank to the southern boundary of Osage, lands, thirty six chains and fifty links, west of the Southeast corner of the lands of the Osage, witnesses by a mound of rocks on the west bank of Neosho river; thence west on the southern boundary of the Osage lands; to the line dividing the territory of the United States from that of Mexico, two hundred and eighty eight miles, thirteen chains and sixty six links, to a mound of earth six feet square at base, and five and a half feet high, in which is deposited a cylinder of charcoal twelve inches long and four inches diameter; thence south along the line of the territory of the United States and of Mexico, sixty miles and twelve chains to a mound of earth six feet square at base and five and a half feet high, in which is deposited a cylinder of charcoal eighteen inches long and three inches diameter; thence east, along the northern boundary of Creek lands, two hundred and seventy three miles fifty five chains and sixty six links to the beginning; containing within the survey thirteen millions five hundred and seventy four thousand

168 one hundred and thirty five acres and fourteen hundredths of an acre. And whereas, the United States have also caused the said tract of eight hundred thousand acres to be surveyed, and have authorized the boundaries thereof to be as follows: Beginning at South east corner of Osage lands, described by a rock from which a red oak twenty inches diameter bears south twenty seven degrees east seventy-six links, and a burr oak, thirty inches diameter bears south fifty nine degrees west one chain; and another burr oak thirty inches diameter, bears north eight degrees west, one chain and thirty seven links, and another burr oak forty inches diameter bears north thirty degrees west, one chain and eighty one links and running east twenty five miles to a rock on the western line of the State of Missouri, from which a post oak ten inches diameter bears north forty eight degrees, thirty minutes east, four chains; and a post oak twelve inches diameter, bears south sixty two degrees east five chains; thence north, with the western boundary of the State of Missouri, fifty

miles to a mound of earth five feet square at base and four and a half feet high, thence west twenty-five miles to the north east corner of the lands of the Osages, described by a mound of earth six feet square at the base and five feet high, thence South along the Eastern boundary of Osage lands fifty miles to the beginning; containing eight hundred thousand acres.

Therefore in execution of the agreements and stipulations contained in the said several treaties, the United States have given and granted any be these presents do give and grant unto the said Cherokee Nation, the two tracts of land surveyed and hereinbefore described, containing, in the whole thirteen millions, three hundred and seventy four thousand, one hundred and thirty five acres, and fourteen hundredths of an acre; To have and to hold the same together with all the rights, privileges and appurtenances thereunto belonging to the said Cherokee Nation forever, subject however, to

169 the right of the United States to permit other tribes of red men to get salt on the salt plain on the Western prairie, referred to in the second article of the treaty of the twenty ninth of December, one thousand eight hundred and thirty five, which salt plain has been ascertained to be within the limits prescribed for the outlet agreed to be granted by said Article; and subject also to all the other rights reserved to the United States, in and by the article herein before recited, to the extent and in the manner, in which the said rights are so reserved; and subject also to the conditions provided by the Act of Congress of twenty eighth of May, one thousand eight hundred and thirty; referred to in the above recited third article, and which condition is that the lands hereby granted shall revert to the United States, if the said Cherokee Nation becomes extinct or abandons the same:—

In Testimony Whereof, I Martin Van Buren President of the United States of America, have caused these letters to be made patent, and the seal of the General Land Office to be hereunto affixed. Given under my hand, at the City of Washington, the thirty (T. S.) first day of December, in the year of our Lord, one thousand eight hundred and thirty eight and of the Independence of the United States the sixty third.

By the President:

M. VAN BUREN.
H. M. GARLAND,
Recorder of the General Land Office.

170 The Government here called the court's attention to the treaty of August 6, 1846, 9 Stat. 871, 2 Capper 561, adjusting the differences between the eastern and western Cherokees and confirming prior treaties, to treaty of July 19, 1866, 2 Capper 942, to letter of Cherokee Delegation to Secretary of Interior, appearing in 17 Stat. 228, the Cherokee Indians consenting to settlement of the Osage Indians and Kaw Indians west of the 26th Meridian and east and north of the Arkansas River, to treaty of September 29, 1865, 14 Stat. 687, 2 Capper 878, between Osages and United States, by which Osages are to be removed to Indian Territory and United States is to purchase for them lands in Indian Territory with proceeds of their lands in Kansas, to act of Congress of July 15, 1870, 16 Stat. 362, by which the President is authorized to remove the Osages to Indian Territory and according to Osage treaty of 1865 and Cherokee treaty of 1866, to act of Congress of March 3, 1873, 17 Stat. 538, 1 Capper 142, authorizing payment of \$1,650,000 of Osage money to Cherokees in payment of reservation, to act of March 3, 1883, 22 Stat. 624, providing for execution of conveyance by Cherokee Nation to Osage Nation of tract of land before described bounded by main channel of Arkansas River, conveyance to be to United States in trust for Osages and satisfactory to the Secretary of the Interior.

Here the Government offered in evidence certified copy of deed authorized by act just mentioned, dated June 14, 1883, same being Exhibit 2 and reading:

171 "Exhibit 2"

This Indenture Made and entered into this fourteenth day of June A. D. Eighteen Hundred and eighty three, between the Cherokee Nation, by Dennis W. Bushyhead, Principal Chief, Richard M. Wolfe, and Robert B. Ross, delegates of said Cherokee Nation, for and in behalf of said Nation, of the first part, and the United States of American, in trust for the use and benefit of the Osage and Kansas Indians, of the second part, Witnesseth: that

Whereas by the sixteenth Article of the treaty concluded July nineteenth, A. D. Eighteen hundred and sixty six, between said Cherokee Nation and the United States, the said United States acquired the right "to settle friendly Indians on any part of the Cherokee County west of the ninety six degrees" of west longitude, under certain limitations therein mentioned, and

Whereas, under authority of an Act of Congress approved June fifth, A. D. eighteen hundred and seventy two, a certain tract of said County was set apart for the Great and Little Osage tribe of Indians, with a proviso that said Great and Little Osage tribe shall permit the settlement within the limits of said tract of the Kansas tribes of Indians; and

Whereas By virtue of a provision in the Act of Congress of March thirs, eighteen hundred and seventy three, there has been transferred from the proceeds of sale of Osage lands in Kansas, and placed to the credit of said Cherokee Nation the sum of one million, ninety nine thousand, one hundred and thirty seven and forty one-hundredths dollars (\$1,099,137.41) in payment for said tract of land; and

Whereas by an Act of Congress, approved March third, A. D. eighteen hundred and eighty three, three hundred thousand Dollars, (\$300,000) was appropriated "to be paid into the treasury of the Cherokee Nation out of funds due under appraisalment for Cherokee lands west of the Arkansas River" provided, "that the Cherokee Nation through its proper authorities shall execute conveyances satisfactory to the
172 Secretary of the Interior, to the United States in trust only for the benefit of the Pawnees, Poncas, Nez Perces, Otoes and Missourias and Osages now occupying said tract as they respectively occupy the same, before the payment of said sum of money:" now,

Therefore by authority of an Act of the National Council of the Cherokee Nation aforesaid, approved May eighth, eighteen hundred and eighty three, which recites "That Dennis W. Bushyhead, Principal Chief, Richard M. Wolfe, and Robert D. Ross, delegates of the Cherokee Nation, are hereby authorized and empowered, in the name of the Cherokee Nation, to execute deeds of conveyance as required by said Act, March third, eighteen hundred and eighty three, for the tracts of Cherokee land for the benefit of the Pawnees, Poncas, Nez Perces, Otoes and Missourias and Osages, as they respectively occupy the same", said party of the first part, by the aforesaid principal chief, and delegates, and in consideration of the payment of the sum of money mentioned in the Act of March third, eighteen hundred and eighty three, aforesaid, as due under appraisalment for Cherokee lands west of the Arkansas River, and of the further sum paid under the Act of March third, eighteen hundred and seventy three, as aforesaid, dies by these presents bargain, sell, remise, release, relinquish, and confirm unto the said party of the second part, forever, in trust nevertheless and for the use and benefit of the

said Osage and Kansas Indians, All those certain tracts of land lying and being in the Indian Territory, embracing the following townships and fractional townships, north, and east of the Indian Meridian—the fractional townships being on the left bank of the Arkansas River;

Fractional townships twenty four (24) twenty five (25) and twenty six (26) Range two (2) east;

Fractional townships twenty three (23), Twenty four (24) twenty five (25) twenty six (26) twenty seven (27), twenty eight (28) and twenty nine (29), range three (3) east.

173 Fractional townships twenty three (23), twenty four (24), twenty five (25) twenty six (26), and twenty seven (27), township twenty eight (28), and fractional township twenty nine (29) range four (4) east;

Fractional township twenty three (23) and twenty four (24) townships twenty five (25) twenty six (26) twenty seven (27) twenty eight (28) and fractional township twenty nine (29) range five (5) east;

Fractional townships twenty-two (22) and twenty three (23), townships twenty four (24), twenty five (25) twenty six (26), twenty seven (27) twenty eight (28) and fractional township twenty nine (29), range six (6) east;

Fractional townships twenty one (21) and twenty two (22) townships twenty three (23), twenty four (24), twenty five (25) twenty six (26), twenty seven (27), twenty eight (28) east; and fractional township twenty nine (29), range seven (7) east;

Fractional townships twenty one (21) and twenty two (22), townships twenty three (23) twenty four (24), twenty five (25), twenty six (26), twenty seven (27), twenty eight (28) and fractional township twenty nine (29); range eight (8) east;

Fractional townships twenty (20) and twenty one (21), townships twenty two (22) twenty three (23) twenty four (24) twenty five (25), twenty six (26) twenty seven (27), twenty eight (28) and fractional township twenty nine (29) range nine (9) east;

Fractional township twenty (20), townships twenty one (21), twenty two (22) twenty three (23), twenty four (24), twenty five (25), twenty six (26), twenty seven (27) twenty eight (28) and fractional township twenty nine (29), range ten (10) east;

Fractional township twenty (20), townships twenty one (21), twenty two (22) twenty three (23), twenty four (24), twenty five (25), twenty six (26), twenty seven (27) twenty eight (28) and fractional township twenty nine (29), range eleven east;

174 Fractional townships twenty (20), twenty one (21), twenty two (22), twenty three (23), twenty four (24), twenty five (25) twenty six (26) twenty seven (27), twenty eight (28) and twenty-nine, range twelve (12) east; according to a plat of lands annexed hereto, marked "A", and made a part of this conveyance; containing in all one million five hundred and seventy thousand, one hundred and ninety six and thirty hundredths acres (1,570,196.30) hereby granted. Under the act aforesaid, there has been set forth for the Kansas Indians, as provided by said Act, the following numbered townships and fractional townships, being a part of the lands above described, and indicated upon the before mentioned plat;

Fractional townships twenty seven (27), twenty eight (28) and twenty nine (29), range three (3) east;

Fractional township twenty seven (27), township twenty eight (28) and fractional township twenty nine (29), range four (4) east: The West half of Sections three (3), ten (10) fifteen (15) twenty two (22) twenty seven (27) and thirty-two (32), and Sections four (4), five (5), six (6), seven (7) eight (8) nine (9), sixteen (16), seventeen (17), eighteen (18) nineteen (19) twenty (20) twenty one (21) twenty eight (28) twenty nine (29), thirty (30), and thirty one (31), of townships twenty seven (27) north, range five (5) east; The West half of Sections three (3), Ten (10), fifteen (15), twenty two (22), twenty seven (27), and thirty four (34), and Sections four (4), five (5), six (6) seven (7), eight (8), nine (9), sixteen (16), seventeen (17), eighteen (18) nineteen (19) twenty (20) twenty one (21), twenty eight (28) twenty nine (29) thirty (30) thirty one (31), thirty two (32) and thirty three (33), of township twenty eight (28), north, range five (5) east;

The West half of Sections fifteen (15), twenty two (22), twenty seven (27) and thirty four (34), and sections sixteen (16) seventeen (17), eighteen (18), nineteen (19) twenty (20), twenty one (21) twenty eight (28), twenty nine (29) thirty (30) thirty one (31), thirty two (32), and thirty three (33), of township twenty nine (29) north, range five (5), east; Containing an area of one hundred thou-

sand; one hundred and thirty seven and thirty two hundredths acres (100,137.32), which aforesaid lands were paid for by the Osages to the Cherokees, and the Kansas Indians have paid for that portion assigned to them by proper transfer of the funds arising from the sale of their lands in Kansas; together with all and singular the hereditaments and appurtenances belonging or in any wise appertaining to the lands hereby granted;

To Have And To Hold the said premises, as above described, with the appurtenances, unto the said party of the second part, for the use and purposes aforesaid:

In Witness Whereof the party of the first part hath subscribed this conveyance by the said principal chief and delegates, aforesaid, who have also hereunto set their hands and seals this fourteenth day of June A. D. eighteen hundred and eighty three.

THE CHEROKEE NATION,

By Dennis W. Bushyhead, L. S.
Principal Chief,

(Cherokee Seal)

RICHARD M. WOLFE, L. S.
ROBERT B. ROSS L. S.
Delegates of the said Cherokee Nation,

Signed, sealed and delivered in the presence of:

Jos. K. McCammon,
N. P. Loveridge,
Wm. A. Phillips.

District of Columbia,
County of Washington—ss.

On this fourteenth day of June A. D. eighteen hundred and eighty three, before me a Notary Public in and for the District aforesaid personally came Dennis W. Bushyhead, Richard M. Wolfe, and Robert B. Ross, to me known to be the persons who executed the foregoing instrument, and acknowledged the same to be their free act and deed, for the purposes and under the authority therein mentioned.

(Seal)

GEO. M. LOCKWOOD,
Notary Public.

Secretary of the Interior, dated March 20, 1883, the same being Exhibit 3 and reading:

177

(Exhibit 3.)

Department of the Interior

Office of Indian Affairs.

Washington March 20, 1883.

Land

5178

5179-1883

The Honorable,
The Secretary of the Interior.

Sir:

I have the honor to acknowledge the receipt, by Department reference, of a communication dated the 15th instant signed by Hon. W. A. Phillips, for the Cherokee Nation, asking for such a description of the lands in the Indian Territory, occupied by the Osages, (and Kansas) Pawnees, Poncas, Nez Perces, and Otoes and Missourias respectively, as may be necessary for the execution of conveyances for these several tracts to the United States in trust for the several bands or tribes, as provided by an item on the Sundry Civil Act, approved March 3, 1883, page 24.

In reply I have to say that by the Act of Congress, approved June 5, 1872, (17 Stat. 228) the following described tract of country, in the Indian Territory, was set apart and confirmed as a reservation for the Great and Little Osage Nation of Indians, viz: Bounded on the east by the ninety-sixth Meridian, on the south and west by the North line of the Creek Country and the main channel of the Arkansas River, and on the north by the south line of the State of Kansas, with proviso, "That said Great and Little Osage tribe of Indians shall permit the settlement within the limits of said tract of land (of) the Kansas tribe of Indians, the lands so settled and occupied by said Kansas Indians, not exceeding one hundred and sixty acres for each member of said tribe, to be paid for by said Kansas tribe of Indians out of the proceeds of the sale of their lands in Kansas, at a price not exceeding that paid by the Great and Little Osage Indians to the Cherokee Nation of Indians."

The tract of country set apart as aforesaid, embraces the following townships and fractional townships, north
178 and east of the Indian Meridian, viz:

Fractional townships 24, 25 and 26, Range 2 east;

Fractional townships 23, 24, 25, 26, 27, 28 and 29, Range 3 East;

Fractional townships 23, 24, 25, 26, 27, township 28 and fractional township 29, range 4 east;

Fractional townships 23 and 24, townships 25, 26, 27, 28 and fractional township 29, range 5 east;

Fractional townships 22 and 23, townships 24, 25, 26, 27, 28 and fractional township 29, range 6 east;

Fractional townships 21 and 22, townships 23, 24, 25, 26, 27, 28 and fractional township 29, range 7 east;

Fractional township 21 and 23, townships 23, 24, 25, 26, 27, 28, and fractional township 29, range 8 east;

Fractional townships 20 and 21, townships 22, 23, 24, 25, 26, 27, 28 and fractional township 29, range 9 east;

Fractional township 20, townships 21, 22, 23, 24, 25, 26, 27, 28 and fractional township 29, range 10 east;

Fractional township 20, township 21, 22, 23, 24, 25, 26, 27, 28, and fractional township 29, range 11, east;

Fractional townships 20, 21, 22, 23, 24, 25, 26, 27, 28 and 29, range 12 east; containing an area of 1,570,196.30 acres.

All of the fractional township on the Arkansas River lie on the left bank of the said river.

Of the lands set aside and confirmed to the Osages, under the act aforesaid, there has been set apart for the Kansas Indians, as provided by said act, the following numbered fractional townships viz:

Fractional townships 27, 28 and 29, range 3 east;

Fractional township 27, township 28 and fractional township 29, range 4 east;

The west half of sections 3, 10, 15, 22, 27 and 32, and sections 4, 5, 6, 7, 8, 16, 17, 18, 19, 20, 21, 28, 29, 30 and 31, of township 27, north of range 5 east;

The west half of sections 3, 10, 15, 22, 27 and 34 and sections 4, 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32, and 33, of township 28, north of Range 5 east;

The west half of sections 15, 22, 27 and 34 and sections 16, 17, 18, 19, 20, 21, 28, 29, 30, 31, 32 and 33, township 29
179 north of range 5 east, containing an area of 100,137.
32 acres.

These lands were paid for by the Osages to the Cherokees and the Kansas Indians have paid for that portion assigned to them by proper transfer of the funds arising from the sale of their lands in Kansas.

It is proper to state in this connection, that the act of March 3, 1883, makes no provision for a separate conveyance to the United States in trust for the Kansas Indians, of the lands occupied by said Indians.

By the fourth section of the Act of Congress approved Apl. 10, 1876, (19 Stat. 29) a tract of country was set apart for the Pawnees, described as follows: viz:

All that tract of country between the Cimarron and Arkansas Rivers, embraced within the limits of townships 21, 22, 23 and 24, north, range 4 east;

Townships 18, 19, 20, 21, 22, 23, and 24, north range 5 east;

Townships 18, 19, 20, 21, 22 and 23, north range 6 east of the Indian Meridian.

A portion of the lands thus set aside lies within the country ceded to the United States by the Creek treaty of 1866.

A correct description of that portion thereof embraced within the Cherokee Country is as follows: the fractional townships being on the right bank of the Arkansas River, viz: township 21, and 22, and fractional townships 23 and 24, north of range 4 east; townships 21 and 22, and fractional townships 23 and 24, north of range 5 east;

Township 21 and fractional townships 22 and 23, north of range 6 east;

Township 20, north of range 5 east, except Lots 7, 8, 9, and 10, section 31; Lots 5, 6, 7 and 8, section 32; Lots 5m6m7 and 7 section 33; Lots 5 3m7 and 8 section 34; Lots 5, 6, 7 and 8 section 35; and lots 5, 6, 7 and 8, section 36.

Township 20, north of range 6 east, except lots 7, 8, 9 and 10 section 31, Lots 5, 6, 7 and 8 section 32; lots 5, 6, 7 and 8,

section 33; lots 5, 6, 7 and 8 section 34; lots 5, 6, 7 and 8 section 35; and lot 1, section 36; except also so much of section 36 as lies within the present X Creek reservation.

The area of that portion of this reservation embraced in the Cherokee Country is 230,014.04 acres.

Under the provision in the Indian appropriation act of May 27, 1878, (20 Stat. 74) the Nez Perces were located on lands west of the Arkansas River, embracing townships 25 and 26 north of range 1 west, and townships 25 and 26, north of range 2 west of the Indi Indian Meridian, containing the area of 90,710.89 acres.

Under the prociisions contained in the Indian appropriation acts of August 15, 1876, (19 Stat. 192) and May 27, 1878 (20 Stat. 76) the following described tract of country was set apart for the Panecos, viz:

Township 24 and 25, north of range 1 east;

Fractional townships 24 and 25, north of range 2 east;

Fractional townships 24 and 25, north of range 3 east;

Fractional townships 24 and 25 north, range 4 east of the Indian Meridian, containing 101,894.31 acres.

Under the provisions of the act of March 3, 1881, (21 Stat. 380) there has been assigned to the Ote and Missouriias the following, viz:

Townships 22 and 23, north of range 1 east;

Township 22 and 23, north of range 2 east;

Township 22 north of range 3 east;

Fractional township 23, north of range 3 east of the Indian Meridian, containing 129,113.30 acres.

All the fractional townships described as having been set apart for the Pawnees, Poncas, and Otoe and Missouriias, that on the right bank of the Arkansas River, are opposite to the fractional part thereof assigned to the Osages.

All of the foregoing described lands are embraced in the country ceded to the United States by the 16th Article of the Cherokee treaty of 1866 for the purpose of settling friendly Indians thereon (14 Stat. 804) and are covered by the patent issue issued to the Cherokees, December 31, 1838.

Mr. Phillips' letter is herewith returned.

181 It is proper to add that all the islands in the Arkansas River above the north boundary of the Creek Country, except Beaver and Turkey Islands, in township 23, north range 3 east,—which belongs to the Otoe and Missourias—belongs to the lands set apart for the Osage and Kansas Indians.

Very respectfully,

Your obedient servant,

D. J. PRICE.

(Maxwell)

182 The Government here offered in evidence certified copy of plat of Interior Department of 1872, showing Township 23 N. Range 3 E. of the Indian Meridian, containing the islands known as Beaver Island and Turkey Island, a copy of said certified copy, marked Exhibit 4, appearing at the end of this statement of facts and forming part of the same.

The Government here offered in evidence certified copy of Interior
plat of ~~Indian~~ Department survey, showing Township 21 N., Range 8 E. of the Indian Meridian of survey of June 11, 1872, which indicates location of island in controversy unsurveyed. A copy of said certified copy appears at the end of this statement of facts, is marked Exhibit 5 and is made a part of this statement of facts.

The Government here offered in evidence certified copy of Interior
plat of ~~Indian~~ Department, showing Township 21 N., Range 9 E. I. M. of survey of 1872, embracing lands in township in which defendant Edmundson, under his homestead entry, of Lots 8, 9 and 10 in Section 30, claims the eastern portion of the island in controversy. A copy of said certified copy appears at the end of this statement of facts, is marked Exhibit 6 and is made part of the same.

The Government offered in evidence a certified copy of Interior plat of the ~~Indian~~ Department of 1908, showing Township 21 N., Range 8 E. I. M., showing portion of island in controversy Interior lying in Range 8, and also certified copy of plat of the ~~Indian~~ Department of Township 21 N., Range 9 E. I. M., showing that copies part of island in controversy which lies in Range 9. ~~xxx~~ of said certified copies appear at the end of this statement of facts, being marked Exhibit 7 and Exhibit 8 and are made part of this statement of facts.

183 The Government introduced, during the testimony of witness, H. J. Behning, as hereinafter shown, a plat made by said witness, H. J. Behning, of the island in controversy in this cause, a copy of which marked Exhibit 9 appears at the end of this statement of facts and is incorporated in and forms part of this statement of facts.

During the testimony of H. J. Behning, as hereinafter shown, the Government offered in evidence the plate of the island in controversy and the Arkansas River made by the said Behning on April 15, 1914, a copy of said plat marked Exhibit 10, appearing at the end of this statement of facts, being incorporated in and forming a part of this statement of facts.

184 H. J. BEHNING, witness for plaintiff testified:

Direct Examination

By Mr. Taylor:

Witness has been a civil engineer for over 20 years, though he has only practiced continuously for the past 15 years. Formerly he was a resident of Pawhuska, Oklahoma, where he occupied the position of county surveyor of Osage County. This service began about the beginning of statehood—1917—and continued for a period of five years. As county surveyor witness had occasion quite frequently to make observations along the Arkansas River joining the Osage Reservation. He also made surveys of the island in controversy in this suit, located in ranges eight and nine, T. 21 N. As a result of these observations witness made plats showing the conditions, distances, courses, etc., surrounding the island. Exhibit 9 is the result of witness's work in making these observations and

survey in 1911. Witness testified in the State Court in the case involving this same island as a witness in behalf of Larry Nolegs. In making the plat (Exhibit 9) witness used data obtained from Government field notes of the survey of 1871, also the records of the surveys of 1872 and 1908 together with observations. He checked some discrepancies and found the facts on the ground on the island. The records referred to in making Exhibit 9 were obtained from the files of the Indian Office at Pawhuska, and according to his information, were the original records deposited with the Indian agent. Referring to Exhibit 9 witness indicated that he started in making this survey at the corner of Sec's 25, 30, 31 and 36 on the south part of the plat on the range line, from that point he proceeded north running the range line according to the Government field notes following the calls indicated therein. The first call of the old original survey was of 35 chains to the right bank of the Arkansas river which witness noted on the plat and marked thereon as "old shore line right bank south channel" showing a difference in the location of 185 the bank at the time witness made his survey in 1911 and the call as it existed in the survey of 1871 to be, 3 chains and 6 links. The next call located which [occured] in the field notes of 1871 was the point for the quarter corner, or, otherwise the half-mile corner, indicated on the field notes as being in the river. Witness in his survey found it to fall on a little elevation, approximately 100 feet in length and possibly 25 or 30 feet in width and about 7 or 8 feet above the average bed of the river on a kind of a sand bar grown over deposited, a small island covered with vegetation. The next call [occurring] in the 1871 survey was located by witness on the south bank, south shore of the island. In the survey of 1871 witness states there was no call for the south shore of the island. The call for the quarter corner which fell in the river in the survey of 1871 was 40 chains, being one half of mile from where witness started. The next call was fifty-two seventy to island, with the notation eight forty chains width. Witness located fifty-two seventy points upon his plat, as north shore of island found by the survey at that time, according to the field notes and is his construction of the call fifty-two seventy to island eight forty chains wide. The point on witness's plat is noted "old shore line right back of north channel," indicated by a straight line parallel to the island running up and down the river. Witness stated that the straight line running parallel to the sides of the island, within the island marked "Old shore line left bank of south channel" is the south shore or point for the south shore of the

island according to distances given in the field note and according to his construction of the Government field notes of 1871. The distance on witness's marked "old shore line left bank of south channel" to the point marked "old shore line right bank of north channel" is eighty chains and forty links, given as the width of the island and the Government field notes of 1871. The next call [occurring] in the field

notes located on witness's plat, was the left bank of
186 the river at sixty chains and eighty-seven links, which is given on that range line in the Government field notes

of 1871. In regard to the left bank of the north channel of the river witness found the call just on the bank, approximately where it had always been—found it all right—just where it had been; marked on witnesses plat as M. C., which stands for meander corner. This corner was re-established in 1908 survey at that point on the bank and the notation is "M. C. left bank of north channel". Witness stated that all calls heretofore given by him run [due] north from the section corner which he gave as the starting point in the survey of 1871, and that he traced the island on his plat as shown by the Government survey of 1871, and field notes of that survey which he found in the office of the Indian Agent at Pawhuska. Witness states that the part marked on his plat Ex. 9, as island is the outline of the island as he used the survey of 1908, and that indicated as north channel is the channel of the river north and east of the island, and the south channel is that which is south and west. The island not being directly east and west. Witness stated that the calls mentioned were made by actual work upon the range lines and that he has platted on his plat (Ex. 9) in lower left hand corner the lots and subdivisions embraced in Sec. 25 T. 21 N. R 8 E. Indian Meridian. He further states that the figure one with a circle around it appearing in the section next to the river indicates lot 1 sec. 25 as designated on the survey plats and the one marked 2 is lot two in said section and the same applies to three and four, and on the north side of the river same section we have lots 5 and 6. In regard to Sec. 30 T. 21 N. R 8 E. Indian meridian south of the river we have lots 8, 9 and 10 as shown by witness plat, and north of the river—range nine—lots 1, 2, 3, 4, 5, 6 and 7, indicated by witness in the same way. The plat also shows the northeast corner of said section thirty as one subdivision by itself and the southwest quarter as one subdivision. Witness also states that he indicates by

187 figures near the numbers of the lots the acreage of the various lots referred to in Sees. 25 and 30. For example, that in lot 1 of Sec. 25 being 12.20 acres. The Govern-

ment field notes of seventy-one gave a meander line along the river in sections 25 and 30 and witness traced on his plat the meander lines as called for by said field notes which is indicated on plat by a solid line; that on the south being labeled "old shore line and meander line, Survey 72." In the opinion of the witness this survey was begun in seventy-one and concluded in seventy-two. The acreage of the lots indicated on the plat witness got from the field notes. The plat also shows where there has been any apparent accretion or erosion along the banks of the river through Secs. 25 and 30 based on actual [survey] by him since the survey of 1872. For instance, the south part of Sec. 25 nearing the south shore of the river. Tracing the old meander line from the point as given in the field notes for the meander corner, given as 35 chains, running the meander line to the west boundary, witness ran the actual shore line and traced it in by comparison. Taking the shore line on the south side of the river, being the right hand bank, south of the island, the solid line which runs along Sec. 25 is the old shore line under the survey of seventy-one as indicated by the field notes, and the dotted line which runs along Sec. 25, crossing it in places is the actual shore lines as witness found it evidenced by the plat. In the northwest part of Sec. 25 near the north line of lots 1 and 2 there were accretions—approximately five or six acres adjoining a lot understood by witness to be part of the Thomas farm on the bank of the river above the island. So that witness estimated there was added by accretion to this farm at the upper left hand corner on south bank of river 5 or 6 acres of land. On the south side of the river in Sec. 25 witness found erosion in lots 3 and 4, the banks being cut away from a point beginning at practically nothing on the range line and with the same angle of the range line, of over three chains, which means in a direct or right angle distance would not be quite so much. So that the comparative loss or gain by accretion and erosion to lots 1, 2, 3 and 4 in sec. 25 on south bank of river would approximately balance each other. The calls in the survey of 1871 made but one reference to the island. That was the call at fifty-two chains seventy links, north of the section corner at the place of beginning. By taking that point as representing the north shore line of the island witness located the old location of the island. If the call fifty-two seventy meant that the surveyor had just reached the island going north, it would have been necessary to indicate the north shore of the island north of the point given for the meander corner on the left bank of river to give it the width, eight chains and forty links called for in the field

notes, so that if he had taken the first mentioned of the island as being the south shore, and the surveyor had just reached the island, and given the island the width called for on the range line, it would have thrown it clear overlapping the north bank of the river, and construing the notes as a surveyor witness knew they could not be construed in that way for the reason that he could not check out. Witness's construction is that fifty-two seventy is the point indicating the north shore of the island and he places the island farthest south and as near the Pawnee County side of the river as possible in construing the field notes; so that though it is of interest to the Government to have the island as far north as possible, his construction places it as far south as possible. It is witnesses opinion that the surveyor did not intend to survey the island but was simply running the range line and measuring the island on the line, and since the surveyor gives eight chains and forty links at the point fifty-two seventy, to the witness mind as a surveyor, that indicates he had already passed over that measurement or he would not have known it. When he reached that point he was leaving the island and noted at that time the width of the island he had crossed over, in harmony with his conduct in not making a survey of the island. Witness states that according to his plat there had been about two chains and sixty links erosion on the

189 range line of the north shore of the island, about 170 feet, and on the range line of the south side of the island there was approximately the same or a trifle more made land than was taken off the north side. Placing the island as far south as he could under his construction of the field notes of 1871, witness found the width of the south channel of the river on the range line to be about nine chains and thirty links. This he arrived at by taking the eight chains and forty links, the width of the island, from the call fifty-two seventy, which he took as the north bank, thus leaving the call forty-four chains and thirty links for the south shore under the old survey. To arrive at the width of the south channel you subtract thirty-five chains, the call on the south bank from forty-four chains thirty links leaving nine chains and thirty links, the narrowest width of the channel that can be given under the field notes of seventy-one. As to the width of the north channel as shown by the Government field notes of 1871, putting the island in the location he has witness found the width to be eight chains and seventeen links on the range line, making the difference one chain and thirteen links or about seventy-five feet. So that placing the island as far towards the Pawnee side as possible under his construction of the field notes, witness finds the south channel to be

one chain and seventeen links wider than the north channel. Witness made actual observations of the island along the range line as to the land cut away and the land made. He observed a difference in the character of the vegetation between that existing on the south shore of the island and that going north across the island on the range line. At the point indicated to be the south boundary of the island as located in the previous survey, the timber was of greater growth—heavier and larger trees—north than any part south of the range line. The timber south of the line had the appearance of being of an age not to exceed twenty-five or thirty years, while that north of the line is as old and long as any
190 timber in that part of the country. The same as it is on the banks of the river. Witness found the change in the vegetation occurred practically at the point noted on the plat as old shore line, left bank of south channel. The newer vegetation being south and the older north of that point. He also noticed some difference in the soil occurring north and south of the old shore line, but not to a great extent. Witness indicated the acreage of lots 9 and 10 and 6 and 7 in section 30, range 9 T. 21 south of the river. Since he indicated these lots on the plat he made a survey from which he got information as a surveyor as to whether there has been any loss or gain by erosion and accretion. There was a gain on these lots, though he did not measure it. He knows, however, that this point was about 300 feet from the bank of the river. At this point the Government offered in evidence Ex. 9 in connection with the testimony of this witness to which there were no objections. Witness stated that he made plat (Ex. 10) which is also based upon the Government field notes of 1871-72 as well as those of 1908 and his own actual survey on the ground. This plat is made primarily to show elevations and shows the island marked "Island" which is the same island in ranges 8 and 9, T. 21 M. The north channel of which is that near to the Osage County side of the river; and the south channel is that on the Pawnee side. Witness has also indicated on this plat by the same memoranda the old shore line as he gave them on plat Ex. 9. He indicated by wavy signs the channel of the river. The small dots indicate sand; sand bars. These same signs appear on the south channel, while there is also a small stream of water running through. The lines with dots between them indicate the cultivated land. The same applying to the island. The dots indicate timber growth, foliage and any kind of timber. In some parts witness has indicated the larger trees by the fig-

ure of a small tree, the same applying to the island.

191 The small lines that run through the marks which indicate the timber within the limits of the island indicate the change in elevation or depression on the island. In other words, the small lines referred to by witness indicate a change in the elevation without indicating whether it is higher or lower. The higher places or the depressions would be at the wide point of the mark. Witness states that the changes in elevation were immaterial; four or five feet; two or three feet. Witness states that he started the topographical observations from an arbitrary bench mark at the railroad crossing on the range line, indicated by the line running somewhat diagonally up through the island marked "M. K. & C. R. R.," At the range line he took a point on top of the south rail of the railroad as his arbitrary bench mark from which he figured the relative elevations of the water and the shore and the island. The figures "B. M. elevation 100" witness states is an assumed or arbitrary elevation of a plain 100 feet below the top for the purpose of illustrating and for the convenience of keeping the figures, and to avoid dealing with plus and minus, and is used so that he can give the elevation of objects in comparison with that and upon that scale. Coming south from the point on the top of the south rail of the railroad track marked "100" towards the river, witness made observations there which are noted on the plat 98.50, 94.10, 91.50, 93.25 and 94.35, indicating the elevations at those points in comparison with his bench mark. Witness explains that the figures 98.50, the first point south of the railroad down the range line is a foot and one-half or 18 inches below his bench mark, so that we arrive at the height or depression of any points he mentions on the plat by subtracting the figure from his bench mark, 100. The lowest mark on the north shore of the river, 94.35, indicates the top of the river bank at that point to be 5.65 feet. In order to ascertain the height of the bank of the river, witness states that it is necessary to get the water level; and this he found to be 80.85 which is approximately 19 feet below the bench mark.

192 Thus the height of the bank is arrived at by taking one difference between 80.35 and his mark 94.35 on the bank giving the height of the bank at that point on the range line as about $13\frac{1}{2}$ feet. The bank at that point being abrupt part of the way. Coming down the range line and across the river we find the elevation of the water near the north shore of the island on the line to be the same 80.85. Coming up the bank of the island on top of the bank the elevation is 95.40 the height of the north bank of the island on the range line being 14 feet

and one-half, and about a foot higher than the main land on the north bank of the river. These points witness states were taken at the meander corner on the range line on the north shore of the river of the north channel and on the north shore of the island exactly where the Government surveyors had placed them. He found the point on the island to be one foot higher than the point on the main land, and as he came south on the range line running across the island to the south shore as it existed at the time he made the survey he found the elevation of the south bank to be 93.15 compared with the elevation shown by his bench mark on the railroad of 100. In other words 6.85 or 6 feet and 9 inches lower than the top of the south rail of the "M. K. & T. R. R." Coming down into the bed of the south channel witness found this elevation compared with his bench mark to be 81.05 or 19 feet below, which is the elevation of the water down the bank, making the height of the south bank of the island above the water 12 feet at that point on the range line. Coming down the range line to the call of 40 chains in the field notes which fell in the river in the survey of 1871 witness found a little island which is noted on the plat. The elevation of the island being 88., 12 feet lower than the bench mark or about 7 feet high from the water.

At the time witness made this survey he found the river to be at an ordinarily low level. Witness states that he made the plat and the survey upon which it is based sometime between the 8th and 15th of April 1914, having spent several days there; and he judged the river to be at ordinary low water mark. Coming on down the range line to the south or Pawnee County bank of the river witness found the elevation of that bank as compared to his bench mark to be 94.30, and the elevation of the bed of the river just off of the bank he found to be 82.80, giving height of the bank as about $11\frac{1}{2}$ feet. In the lower left hand corner of his plat nated by him as cultivated land, parallel lines with little dots between them, the mark 92.30 appears. This witness explains to be the elevation compared with his same bench mark. This cultivated land is on the Thomas farm. In response to a question as to the elevation of that cultivated land compared with all the measurements found by him going across the island on the range line as to whether it is lower or higher witness stated it was practically the same. He explained, however, that the Thomas farm is undulating and rolling land, some points being lower and others higher. There are as low points on the Thomas farm as there was on the line on the island, while there are points higher. The line marked Pawpaw Pipe Line, shown on the plat, the witness explained was an ac-

tual pipe line, and he has given the elevations of the island and the water and the banks in the same manner along that line that he did along the range line, the figures being construed in the same manner that he has construed them dealing with the same matter. Witness states that throughout this plat along the shores and the edges of the islands he has indicated the elevations in the same manner relative to the same bench mark, so that from the plat one can ascertain the relative altitude of points on the island and points on the shores where he has made notations. He states that he found water throughout the south channel around the island where he made the survey and so indicated it on the plat. Witness explained that the little circles with vegetation indicated upon them represent islands up and down the

194 channel. Through the island there is a mark which does not come quite down to the range line, cutting off a portion of the island, this mark the witness explains to be a depression or dry branch—slough—which he has noted as such. The elevations of the bed of this dry branch as compared with the surface of the water is given in different places on the plat and runs from 84.20 to 88.50. The elevation of the water in the south channel joining that part cut off by the slough along the pipe line witness places at about 80.75, so so that the elevation of the bed of the slough above the water in the south channel was about from 4 to 8 feet above it. The bed of the slough was filled with sand with a slight show of vegetation which would occur in the spring months composed of weeds which would spring up within a few months' time but no grass or any show of permanent vegetation. Witness states that the permanent vegetation came down to the bed of the branch but not in it, so that in his judgment the bed of the slough was just about the ordinary high water mark of the river along that point, as it showed that it had been overflowed. The main big island indicated on witnesses plat is the island as shown by the meander lines of the survey of 1908 and embraces the same acreage shown by that survey. Witness found all the acreage shown in the plat to be above the line of ordinary high water mark, taking as his basis for that line the line of vegetation of the grasses which are usual to that locality and excluding temporary weeds and things of that character, so that the acreage in the island above the ordinary high water mark as determined by him was the same as returned in the survey of 1908 when the island was meandered, with the exception of fifty-nine and a half acres. However, in making his re-survey, retracing the meander lines, witness found an erosion on the north side of the island

on the west end also along the south line of the island all through and all along the south line varying from a few feet to 20 feet from the meander line, but there was offsetting in my computation all that had been cut off, a corner having been cut off since the survey of 1908. The accretion exceeded the erosion, so that there is a little more island than there was according to the survey of 1908. Witness indicated that part of the island which was cut off by the little line that extends out the north and west portion and explains where the erosion begins also where the accretions begin, the latter extending to the extreme southeastern point of the island. The witness states that he is familiar with the grasses of Osage County and that the grasses that he used in his calculations were those which were common to the uplands and which are of perpetual growth on the uplands. So that in explaining how he arrived at the line of vegetation, witness stated that he found the vegetation growing down from the banks to a practically uniform line, while in other places where there had been erosions or cave-ins there was no vegetation beyond and below the high bank, and in that case, he had nothing to indicate to him the line of vegetation. On the sloping banks where the ground had neither been washed or otherwise disturbed he took an average elevation of the shore line where the vegetation ceased on both the north and south bank of the river and on both sides of the island. He fixed the average point, Taking the elevation at these different points, he made his computations and took an average at probably a dozen different places, which he holds to be the average high water mark. In cases where there had not been erosions or cave-ins and conditions had permitted the growth of grasses, witness found that the grasses came to about the same elevation above the water up and down the river, varying a few inches only and his calculations are made from those points where the grass had an opportunity to grow down bank by reasons of the character of the soil and the formation of the bank, and finding that that was about the same elevation at all points where he could locate such grasses upon the island. In referring to Exhibit 10 witness explained that in going up the range line north of the large island in the north channel marked on the plat by him, he found no island or remains of any island. In the south channel, however, he found some small islands which he noted on his plat. The character of the soil in the south channel was sane—a bar of sand throughout the entire length of the channel. The only vegetation to be found in the south channel was at the base of one of the little islands at the high water mark.

The island of considerable size which he put upon his plat and which lies up the river west of the larger island, the acreage of which is about 4 acres, witness states he found not to be meandered according to the re-survey of 1908, so that it is made entirely from his own survey on his plat. Witness states that he found a very small portion of it to be as high as the elevation of the larger island. At the upper end of the south channel he states he found a sand bar, the average elevation of which was about 2 feet below the ordinary high water mark. In places it was higher and in others lower. He further states that there is a little channel through the island through which the water percolated at which point it was the same elevation as the water of the north channel. Witness states that at the time he made his observation upon which this plat is based, in April 1914, the average depth of the water in the north channel was about 2 feet. Witness states that the height of the bank given in his testimony heretofore was the difference between the elevation on top of the bank and on the surface of the water which did not include the two-foot channel of water in the river. This applies to the other bank elevations given by him. Witness fixed nearly 7 feet as the ordinary high water mark above the surface of the water in the north channel, as appears by the markings of his plat made by him in April 1914. The different elevations shown by the witness relative to the bench mark both on the shores and the islands and upon the cultivated land are average elevations to that locality. He states that he did not pick out either the highest or the lowest point, so that the figures given except where the line is followed straight across the island are figures which give the relative height for that neighborhood on the shore or on the island. He has indicated by lines the extreme height and the depressions. On the line where the pipe line crosses witness states he found part of the island higher than the bench mark, the south rail of the "M. K. & T. R. R." A great part of the island was higher than Thomas's cultivated land or the other cultivated land on the south shore. Witness states that he found nearly four acres of the land on the island that had been cultivated. He also found higher land on the island or as high, that had not been cultivated or cleared, of the same character of soil. The character of the vegetation on the island in a general way compared as to size of trees with the same class of vegetation on the main shores. On the north side of the island the trees were larger. On different points of the plat witness noted the different kinds of trees and the diameter, the trees being indicated by a small drawing of a

tree. The notes show "C" cottonwood; "E" elm; "B. E" box elder; "A" ash; "H" hickory; "W" walnut; "P" pecan; "S" sycamore. The figures indicate the diameters of the trees in inches. All these trees mentioned witness states he found on the island. Witness pointed out the walnut tree on the plat 30 inches in diameter, and states there were several walnuts. Some of the larger trees found by the witness on the island ran up to about 36 inches or three feet through. He states that he found lots of large trees and that he did not take any notes of any smaller than 16 inches. Witness also noted the location of the oil well on the island just west of the range line towards the north shore of the island marked "oil well"; also he has noted at the left shore of the north channel the oil wells he found at the time he made the survey.

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Witness states that the upper right hand corner of the plat is a profile of the island along the range line and the pipe line, the upper profile being the pipe line. In the profile the depressions appear very narrow; for instance, that showing the north channel of the river. This was done on account of the small space of the plat. The width of the channel is not made to be accurate in comparison with the other distances given on the plat though the distances are noted on the plat. The plat shows the height and depth of the different elevations and depressions. Witness states that he had been familiar with the river around the island for about six or seven years. Witness states that he has done surveying work around the island at different times from 1911 to 1914 and prior to that time, and the testimony that he has given concerning his knowledge of the state of the water and one thing and another, is based upon observations made during these various periods. Witness states that in the plat of 1914 he had definitely located the high water mark according to his measurements. In his judgment as an engineer it fell at about the same line of vegetation as during the other years that he observed the conditions around the island. The main channel of the river at the time witness made his survey he found to be in the north channel, most water going through that channel. He made a comparison of the size of the two channels at the time of the survey. These comparisons can be arrived at from the plats that are in evidence. Exhibit 10 was offered in evidence without objection.

Cross-Examination

By Mr. Blake:

Witness states that Exhibit 10, the plat concerning which he has just testified, is drawn to scale in all respects except that part of the profile representing both channels in the northeast corner of the map, and that by applying the scale to his plat distances may be determined accurately. Witness states that at the time he was at the island 199 ly. water was flowing north of the island, as well as in the channel south of the island, though there was a very small amount flowing south of the island. The water flowing south of the island was not uniform, at pools in places it was wider than it was in others, the nearest place he recalls was probably about ten feet, probably a few inches deep which he waded across; about six inches deep. Witness states that he did not approximate the rate of flow of the water, nor would he venture a guess on the flow of the water. The north side of the channel witness states was fordable at that time and he judged about an average of about two feet and one-half deep; the width of the north channel he stated varied. It extended nearly from shore to shore; that is, from the north shore north of the island to the south shore of the east bank. This he has indicated accurately on the plat as it existed at that time. He did not try to determine the rapidity of the flow of the water. He gave the width of the north channel as nearly seven hundred feet on the range line but it was on an angle of about twenty degrees, which would make it somewhat shorter at right angles. Witness states that he approximated this width, which figures at six hundred and ninety-seven feet. The cross-section would be about six hundred and thirty feet, varying from a few inches up to possibly two feet deep in the north channel. Witness stated that the distance from the south mainland to the south line of the island at its narrowest place is some what shorter than from the north mainland to the north of the island at its narrowest place, as shown on the plat.

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Cross-Examination

By Mr. Ledbetter:

Witness states that in the field notes of 1871 there is a reference made to an island eight chains and forty links wide, which island was not meandered or surveyed under that survey. He does not know of any other survey of that locality by the Government prior to the admission of Oklahoma into the Union. He examined the records at the Land Office at Pawhuska, where the records are kept, and found no other

survey prior to the admission of Oklahoma. Since the admission of Oklahoma there was a survey in 1908. All the reference he found to the island in the original survey were lines projecting across an island, and the width of the island was given. Witness states that he made the map referred to at the suggestion of Mr. Taylor who explained to him to a certain extent the issues involved in this suit; he also states that he was on the stand and testified at the time of the former trial of this case in the State Court and with that knowledge he made the map with reference to the issues in this case as he understands them. He does not know, however, that he understands the issues. Witness states that Mr. Taylor made some suggestions as to certain issues which he wished to establish and on which he wanted to show certain information. Witness states that he made the map with a view to making the island as high as it was, and the purpose of the map was to show that the island was actually above high water mark.

Cross-Examination

By Mr. Freeling:

Witness states that the island that is separated from the other on the west end of the main island is about four acres and one-half. Looking at the plat witness explained that the acreage given by him includes all of the island that he deemed to be above high water mark and that quite considerable was below high water mark. He did not measure the amount.

201 Witness could not state positively the amount of island that was below high water mark as he did not measure it. In order to arrive at the ordinary high water mark the island and the banks of the river from both sides at different points, taking the line to which vegetation would extend where grasses would grow. He took the prairie grass as a basis because it [take] more than one season for it to germinate and start and form a sod while weeds of certain classes will grow within a month or two and mature. This line of vegetation he took of his own judgment according to the instructions received by him along engineering and surveying lines based upon court decisions at other points which held that way—that where the line of vegetation ceases was considered the ordinary high water mark. Witness stated that all surveyors take that point uniformly and universally as a basis to arrive at a point. In answer to a question as to who instructed him to use that as a basis in this investigation witness stated that he got his information from Hodge-man's Manual.

Witness does not recall having discussed the method of finding the ordinary high water mark with Mr. Taylor. Wit-

ness states that the figures "86.45" appearing in the stream at the lower east end of the island is the high water mark in that part of the stream, and that the figures "87.50" near the east shore indicate that the end of the island is about one foot higher than the high water mark of the stream joining it at that particular point. Witness explains that the figures "79.55" under the letter "A" means the stage of the water at that time and the points that he has indicated on the island are the elevations as he found them. In order to arrive at these elevations witness states that he made a continuous observation at different points, as the opportunities occurred where he happened to be. At [placed] he could not see but a few feet and had to take it at short range. At other
 202 places he could see two or three hundred feet. In the field, for instance, he could look through the telescope from one end to the other but did not take that very far up. He did not note every observation taken. The actual observations he has in the original notes, though he only noted a few. Witness states that he took the high and low points on the two lines indicated to show the comparison. The remainder of the island he took adjacent to where the larger trees were located. There were little low places indicated on the island as well as high places, the island being undulating and not level, and he took an average of these surroundings. Witness states that he was present when the river was up and went to the island in a skiff and that the only part of the island that he saw under water was the branch [undicated] by him on the plat. Witness states that the only time that he was present when the water was up was during the summer of 1913—May or June, he does not recall. He observed at that time that the south channel was under water too high to ford—to drive [acros accross].

Cross-Examination

By Mr. Burwell:

Witness states that he became acquainted with the farthest island up the stream and recognized it as a separate and distinct island in the river in 1910. As he recalls he was called by the Barnsdall Oil Company in 1909 or 1910 to ascertain the extent of the leases on the main island.

In answer to the question as to whether the small island was not merely a sand bar at the time, witness states that it was not. Witness states that the little island is approximately four or five acres. At the time witness was present during high water he states the rise in the river above the low water stage as shown on his map was possibly three or four feet. Witness could not state of his own knowledge that the islands

203 referred to by him had not been entirely overflowed on some occasions in high water. Witness could not state whether in 1915 the entire [isla] island was submerged, except a small portion between the section line and the pipe line, as he was not there at the time. He states that he made one or two maps of the island just preceding the trial in the State court of Pawnee. In his maps witness did not show any of the little sand bars or islands in the [couth] channel of the river, nor did he show the little islands at the head, therefore he has not personal knowledge as to how high the water rises in either of these channels. Witness states that he only testified as to ordinary high water mark; that ordinary and extreme are two distinct propositions; there is no extreme high water mark. Witness amplified this statement by testifying that even as to ordinary high water mark he was not testifying to what he knew from his personal observation but from "passing evidences" at the time he examined the river.

Redirect Examination

By Mr. Taylor:

Witness states that at the point which he measured at the request of Mr. Blake as being the narrowest point in the south channel, the shore of the island was made up to a great extent of accretion and that he judged there was enough accretion at that point to make up the difference between the width of the channel and the narrowest point in the north channel which he measured, so that taking out what he observed to be accretion at the narrow point in the south channel according to his judgment it would be wider than the narrowest point in the north channel. He did not find any point in the north channel where there was accretion. According to his observation practically the entire south shore of the island was made land, or what showed to be accretion along the whole extent of the island. According to the survey of '71 the accretion on the [shout] shore on the range line was in the neighborhood of 177 feet. Witness noticed the character and size of the trees on the upper end of the main island. The elm trees were about 14 inches and some of the cottonwood might have been a few inches larger. In response to a question by Mr. Taylor

204 as to whether he had any other purpose in making this plat other than to show the true condition of affairs surrounding the island, as he found them, witness stated that he did not. He further stated that in making his calculations as an engineer any desire of Mr. Taylor to show the island to be above high water mark did not enter into his

conclusions. As an engineer witness states his work as County surveyor made him familiar with the Arkansas river at a number of places as he had to do with the installation of bridges at different points. Witness states that his statement concerning the average stages of the water is based upon his knowledge of the entire river and not simply around the island at that point. In the building of bridges witness states that he had occasion to find out the character of the bed of the river. He sounded the river at different places to a depth of 16 feet, which is as deep as he could get a rod down. He could not drive it any further and could not ascertain whether it was rock or the side [pressure] of the sand which prevented the driving of the rod but he was able to drive the rod at places 16 and 17 feet into the bed of the stream not counting any depth of water. This sounding he did in order to ascertain the foundation in connection with his engineering work in regard to the bridges that were being built. The first point he investigated for the erection of a bridge was six miles west of Ralston on the bend and then at Punca City; opposite Punca City, opposite Kaw at Cleveland and at Blackburn. Cleveland is about four or five miles above the island. According to witness's recollection the bed of gravel at Cleveland was not quite as deep as he found it at some points further up. At any rate he ventures to say there was 12 to 15 feet of sand. Witness states that the difference in altitude of the water flow at the head of the island and at the lower end of the island indicates the flow of the river between those points, approximately three-quarters of a mile. He also states the only part of the island shown by him which did not bear
 205 vegetation according to the rule testified to by him, was the little slough which goes into and is noted on the island. There were some small extensions rather above that elevation that had been covered with sand so that there was no vegetation growing on it. The bad soil of the island, witness states, was the only part of the island below ordinary high water mark.

Recross Examination

By Mr. Burwell:

Witness states that he built or superintended the building of three bridges across the Arkansas River—one at a point six miles west of Ralston, one at Punca City, and the other opposite Kaw City. These bridges were built by the Osage and Pawnee Counties. He does not know whether the counties got permission from the Federal Government to [built] these bridges. Witness states, in response to a question by Mr. Burwell as to whether he testified that the soil in the south

channel below the island was made ground, that it is not. The character of the soil in the channel is just such as one would find in a stream where the characteristics are the same as the Arkansas river—flowing through sandy land; It might have previously flown through or might have simply been a channel made by the overflow from the main channel or the sediment itself. Witness testified that the bank on the north side of the island is an abrupt bank on both sides. Witness states that he has been personally acquainted with the location of the island since about 1908, shortly after Statehood, and that he has a map showing the contour of the river to the west. The channel was practically the same as it is now. So far as witness could see the channel had the appearance of having continued in the same way for many years. The high bank referred to witness states continued to the section line where there is a big cut which is about a quarter of a mile above the point beyond the extension of the map. The river in going west bears off slightly to the north forming a bend, and the tendency of the water under such circumstances would be to force itself to the bank. The probabilities in extreme high water are that the stream coming down at it does
205a to the bend would have a tendency to force itself to the opposite bend.

In answer to the question whether the greater probability would be that the deep channel was unable to take care of the water in extreme high floods and would force itself around to the low lands in order to take care of the surplus water, witness replied that it naturally would.

Witness states, referring to the plats showing the curves and contour of the river, the land on the south side of the island marked "93.20" is a little higher along the south bank than it is a short distance further back, which would indicate the current had come around and built up the bank in high water. He further stated that the action of the water at different stages produces different effects; for instance, in extreme high water it deposits sediment on this high bank and in lower stages it undermines that same bank and cuts it away. That has been the action of the river on that part of the bank. Replying to a question as to whether the high bank referred to had in all probability been built by sediment from high overflow, witness stated that the timber did not show such action, the roots of the trees forming right at the surface which would have been covered for several inches with deposit if the bank had been built up like those on the south part of the island where the roots are spread out quit a way down into the sand, which is not the case on the south bank. When-

ever vegetation began to grow on the south bank that vegetation would hold the sand as it would blow by the winds in dry weather and [than] in the next floods it would still [built] up higher with the sediment which the water carried in those seasons. Witness states that from the high bank on the south side of the south channel back to where it runs down quite considerably lower is but a short distance, in some places there is not much of a change while in others there is—

it is kind of a gradual slope. At some points along the
206 bank it is nearly three or four feet higher than at other points. Witness states that there is timber all along the island on the north side as well as on the main bank of the stream on the north side. The timber on the main bank of the north stream, however, has been cleared in places in recent years. He states that the timber on the north bank of the stream may be heavier but it is not any more dense than on the south side of the south channel. Witness states that water seems to be no respecter of character of soils and that the water would not necessarily cut through loose sand and light vegetation more readily than through heavier vegetation. Certain kinds of clay formation of soil will undermine the cave and slide. For instance, along Broad Creek in the Osage Country the Caney river and this stream, that formation exists, and quite large areas slide right bad. Witness states that the land slopes towards the east down stream "and in case of high water this area down south here would be lower than it would be up here," and the tendency of the water would be to cover the entire island before it covered a certain portion referred to by the witness.

Replying to the question as to whether the south channel was made subsequent to the north channel, witness replies that it was not, basing his judgment on the records and the field notes.

Redirect Examination

By Mr. Taylor:

Witness states that his judgment would be that the south channel had originally been the main channel, and the north channel at one time was the minor channel. He bases this conclusion on the changed condition of the Arkansas river, knowing it for twenty years, and that the Arkansas is similar to the Missouri river, with which he is also familiar. There is no regularity by which these rivers can be judged, and the records and field notes are to be given credit and have more credence than ordinary evidence. Witness states that his

207 opinion was also re-enforced by the fact that the north channel is apparently much wider now than it had been years ago, while the south channel shows a process of filling in which is evidence by the vegetation and soil on the south shore of the island.

Recross Examination

By Mr. Burwell:

Replying to the question, "Upon what theory would this water coming down around the bend climb the hill there instead of forcing itself over here," witness stated that it was on account of the sandbar at the head of the island—approximately three or four feet up. Witness stated there was practically no difference between the character of the soil in the north channel and that in the south channel. He also stated that the elevation on the banks was higher than in the river bed and that it would not necessarily follow that the water would climb up the banks but would go through by undermining, and spread out. As he stated before, there was no regularity about the current in the Arkansas river. Witness states that the current would not always follow the lowest point in a stream and that there was no general rule to that effect; all things being equal, it would, but there are always a great many inequalities. The reason for these inequalities he cannot give except by the facts as he found them. All he knows about it is that there are two channels, and the north channel is now the main channel.

Redirect Examination

By Mr. Taylor:

Referring to Exhibit No. 5, Township 21 north, range 8 east Indian Meridian, and particularly to the arrow in the river near the range line between ranges 8, 9 and 10 south and west of the point marked "oil" witness stated that the arrow was placed there to indicate the channel of the river flowing in the direction in which it points, and indicated the main flowing channel of the river at the point where it occurs.

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Recross Examination

By Mr. Burwell:

Witness states that the map marked "Plaintiff's Exhibit No. 6," would join right on to Exhibit No. 5, referred to above, on the east, and for certain reasons he did not indicate on the plat the island which reached over into range 9, township 21, but it is indicated, however, in the field notes. The only thing that shows on the plat is just marked "Island" without indicating how large it is or anything about it.

Witness stated that since seventy-one and two, he did not think the island had increased in size to any great extent. On the plat which was introduced there are about fifty-nine and one-half acres indicated. On Plaintiff's Exhibit No. 10 the larger island indicated by him in the channel of the river embraced between fifty-nine and sixty acres exclusive of the small island, embracing four and one-half acres. He did not make a survey to determine how much there was altogether in these islands. The sand-bars extends below. Witness stated that he did not ascertain how many acres there were between the threads of the streams where they begin "there" and where they separate and come together again. He thinks that there is almost as much more as he includes in the island itself. Witness again states that the largest trees he found on the island were about three feet, and these trees were cottonwood, the walnuts ran from fourteen to twenty-six inches. The witness produced the field notes pertaining to Plaintiff's Exhibit No. 5 and referred to them where it had reference to the point where it crossed the river and from which he got the distance in running the line north and south showing the width to island in river, eight chains. Referring to plaintiff's exhibit No. 10 witness indicated the section corner at which point he started to run the north and south lines. He also indicated the point to which he ran it on the bank of the river. He further states that the call from the corner section to the

209 bank of the river was thirty-five chains, Arkansas river, course east, meaning thirty-five chains from the section corner; "East" meaning the river flowing east. The second call is forty chains for quarter section corner in river, meaning the quarter-section line. The next call says "Place for quarter-section corner in river;" the next call is "52.70, to island in river, width 8.40 chains." The next call going north shows 52 chains and seventy links, which takes you to the point marked "Width 8.40 chains to island in river—width 8.40 chains," the point at which the island ended. Witness stated that the surveyor could not give the distance to a certain point until he had passed over it and had measured it—he gives in the field notes 8.40 chains. The fact that the surveyor states the island was eight chains and forty links wide proves the fact that he has measured it at that point and was at the point of leaving it.

The next call is "sixty chains and eighty-seven links,—leave river." Distance across twenty-five chains and eighty-seven links, ascertained by actual measurement making the total width of the river at that time seventeen hundred and

seven feet, there being no indication of the width of the channel of the river. Subtracting the call 52.70 from the next call, 60.87, the north bank at the end, we have 8 chains and 17 links, or five hundred and thirty-nine feet, the north channel north of the island is Seventy-one and two. Witness states that the actual width of the north channel at present is about six hundred and thirty something feet. Witness states that the banks of the river wore away something less than a foot a year during the past forty or fifty years. Witness states that the distances given in the field notes from the point on the left bank of the river to the section corner is practically the same now as it was in 1872, which would mean that there was no erosion on the north bank of the river to amount to anything.

Referring to Exhibit 5 and to a point in the center of Sec. 26, T. 21 N., R. 8 E., witness states that his reason for the erosion on the south bank of the river is that there is a very high bluff on that bank extending to the edge of the water leaving between the bank of the river and the bluff just about room for a wagon road, a part of which was made by cutting away the bluff. The course of the river being practically south, headed directly for that bluff and in extreme high water striking the bluff and throwing the current to the north across the river, not with such force, however, as to throw it back to the bank but enough to force it against and through the north channel. The erosion, according to witness's observation occurs on the south side of both channels, the condition being the same in both. According to his calculations, the south bank of the island in 1872 was 3 chains and 86 links north of where the bank is now or about 260 feet of earth cut off from the south portion of the island. Witness states that the distance from the present shore line of the island to its shore line as indicated on the south side of the island in 1872 was about 170 feet and that the south line of the island if projected to the west would go approximately into the old slough. He further states that the old slough may have originally been the south channel on the south side of the island. Witness states that there were trees on the piece of land below the old channel across the island. These trees were cotton-wood, measuring 28 inches, which the witness thinks would take about fifty years or longer to grow. The older timber and larger timber predominates on the south-east half of the island. To the south of the old slough running to the west there is timber, but it is small. Witness found some trees to the south on the bank of the river but he did not measure them. They would, however, about compare with the 28 inch cottonwood trees. At this point there were indi-

cations of settlements and the very big trees have all been cut. The field notes show as to the south channel of the river in 1872 that its width is about a chain and thirty links, being a chain and some links wider than the north channel. The field notes do not show the volume of water in it as field notes never do indicate that. Witness states that the slough extends and branches out in different places to the west end of the larger island and it is his opinion that the part south of the branch of the slough extending to the west is made land.

He states that he has no positive opinion as to form and shape of the island for the reason that he has no records dealing with the general outline of the island. The island may have been different from what it is now. Witness states that the north side does not to his mind look any different from the banks on the north side or south side of the island and the indications were that the soil on the north bank was practically the same age as that on the north bank of the north channel. Witness stated that the survey of 1872 did not cover any of the islands in the Arkansas river except two mentioned as "Beaver" and "Turkey" islands, which were adjacent to the Otoe and Missouri reservations, divided only by a very narrow channel, practically of the mainland at that time. He states that there are other islands larger or fully as large as the islands in controversy which were not surveyed; one at Ponca and one about Kaw. None of these islands, however, appear in the plat of 1872. Only as the section line happened to run across an island were field notes made of them, as in the case of the island to the south of Kaw City—the call in that instance being for the island on the section line between 10 and 11. Witness states that for the purpose of determining the acreage, a surveyor would have surveyed the islands, but that in the survey of '72 the islands were not included. This survey was not made with a view of allotting lands to Indians. Witness states that he did not know how much in the ordinary course of events a stream would cut in depth during a year. It would be very slow if the stream had a tendency to fill as in the case of the Arkansas which had rather filled up instead of cut. The south channel also had evidently filled up rather than cut out any deeper. As to the north channel, witness states it appears to be a deep channel now but does not seem to have filled up to any great extent while to all indications the south channel has. He also states that the north channel is capable of taking

care of more water now than it was in '72 by the difference in width, which has been created by erosion.

Plaintiff next offered in evidence the testimony of Charles H. Lamb, as appears on pages 871 to 875 in the record of case of State of Oklahoma vs. Lary Nolegs, et al., as follows:

CHARLES H. LAMB, Cleveland, Oklahoma, called as witness on behalf of the defendant, Larry Nolegs; examined in chief by Mr. Taylor, testified as follows:

Witness states his name is Charles Lamb, and that he has lived at Cleveland practically the entire time since the town started, and is acquainted with the island known as "Turkey Island" involved in this suit. He also knows the island that is near Mr. Thomas's land in the Arkansas river. Witness, during the years 1882 and later, was employed by the Government doing work on the Osage Indian Reservation. During the year 1882 he was on Turkey Island several times. As a boy he went hunting on the island on account of there being lots of turkey and game birds there. He was often accompanied on these hunting trips. Witness remembers Mr. McKinzie, James Mowbray, Will Pappan and Salvino, accompanied him to the island on several different occasions. Witness's occupation under the Government was stone-mason for the Indians. As he recollects it the island at the time was forty or fifty acres in size, covered with vegetation consisting of trees and briars.

In response to a question by the Court as to how large the largest trees were, witness replied that they were probably 18 inches through, and some of the cottonwood two feet through. Witness stated that he observed the channel on the north and south sides of the island, and that he crossed the north channel a time or two. At that time the south channel carried the greatest volume of water, and was the wider channel, as well as the deepest. According to his observation the south channel was the main channel in which there was lots of running water.

213 As he remembers it, witness states that the north channel was shallow and he waded it; pulling off his boots, he waded across through possibly fifteen or twenty steps of water. It was full of little islands with driftwood against them. These small islands were scattered up and down the channel—the only vegetation on them was willows. There were also drift logs and sand. Witness stated that he could not cross from the island to the Pawnee county bank simply

by removing his shoes and rolling up his pants for the reason that it was too deep. He and Mr. Pappan, and possibly Steve Bilyeu, started to cross to the Pawnee county side but concluded that it was too deep.

Mr. Taylor: Take the witness.

The Court: In what year [of] that?

A. '82.

Witness excused.

Plaintiff next offered in evidence the testimony of Aaron McKinzie, found on page 860 of the same record; the direct examination being read to the Court; the cross-examination, at the request of Mr. Burwell, the redirect, recross down to and including page 871, as follows: no objections in the former record being read.

AARON MCKENZIE, Ponca City, Oklahoma, called as a witness on behalf of defendant, Larry Nolegs; examined in chief by Mr. Taylor, testified as follows:

Witness states that he was in the employ of the United States and lived on the Osage Indian Reservation. The last work that he was engaged in there was building stone fire places and chimneys for the Indians, commencing in the year 1881, and continued until 1885. Witness knows where the city of Cleveland is now located and built chimneys farther down the Arkansas river on the Osage side than where the city of Cleveland is located. He states that he is familiar with and knows about where the island in controversy is located. He states that he went down there in 1882 and was on the island once; he camped about three or four miles above the island. The last work he did he camped where Osage

214 City is now and he was up by the Black Dog Mills on the north and a little west of Cleveland. Working with him was a man by the name of Lamb, and also witness's son. Mr. Barnett was there doing the woodwork building—building the houses. Witness stated that he crossed onto the island in 1882 and it was then known as Turkey Island. At the time he crossed to the island he passed through a small channel. Witness stated that in crossing he went in close to the water where there was a little willow island with some little trees on it and drift wood against it; he sat on that and pulled off his boots or shoes and rolled up his pants and waded across the little channel. As he recalls it, the channel was not over 15 or 20 steps. He states that there were a number

of little willow islands in the bed of the channel on the then Osage side of the island. He remembers as many as two of these small islands. Witness stated that he crossed from the Osage Indian Reservation south over to the Island. From his best recollection witness states the south channel of the island carried the most water around the island. He judged this from the fact that the water was shallow where he crossed, and the main channel of the river where the water was going was quite a little stream though the water was low at the time. Witness states that at the time he was there in '83 there was a big rise in the river at which time the banks were full and backed up a little stream away up; it also overflowed some of the bottoms including the bottom at the mill. This rise in the river was considered a pretty good raise.

Cross-Examination

By Mr. Riddison:

Witness states that at the time he went over to the island he was working where the mill was and his work was scattered up and down. He cannot recall just what Indian, or what house he was working for at the time he visited the island. The name of the Indian for whom he worked nearest to the island was "She-ha-ne-she." This Indian's place was a couple of miles, or a little more, north and west of the island. There were no Indians south of the island on the Oklahoma side. Witness states that he has camped where Osage
215 Junction is but at the time he was on the island he camped up at the mill. The mill was up the river about six or seven miles above the island. Witness stated that he and some others were, on the occasion of his visit to the island, hunting on the Osage side. He states that he does not recollect going to the south side of the island—for that reason he could not say anything about the condition of the channel on the south side. Witness states that at the time he crossed to the island from the north side there was water running through the channel he waded across. He found nothing but green briars and grape vines on the island so he came back. Witness states that about eight or ten years ago he returned to the vicinity of the island at the time old man Severne lived there north of it. Severne's lease ran right up to the river bank across or a little above the island. This lease was on the Osage side of the river and ran up nearly opposite the island.

Redirect Examination

By Mr. Taylor:

In response to a question as to whether he observed any timber on the island, witness replied that there was timber on

the island consisting of some pretty good trees. Witness states that the island that he went down to hunt on was quite an island, and the largest one he found.

Cross-Examination

By Mr. Ledbetter:

Witness states that he often hunted in the neighborhood of the island in '82 and '83; he would always go out on Sunday to hunt or fish during those days; he states that a period of more than twenty-five years has elapsed between the time he made the trip to the island and the time his attention was called to the facts concerning his visit. Replying to a question by Mr. Taylor as to his age, witness stated that he would be seventy-five the 24th of April according to his father's record bible.

Plaintiff next offered in evidence the testimony of S. R. Burnett in the same case on pages 857 to 860. The direct examination being read as follows:

216 S. R. BURNETT, residence near Ponca, Oklahoma, called as a witness on behalf of defendant, Larry Nolegs; examined in chief by Mr. Taylor, and testified as follows:

Witness states that in former years he lived within the Osage Indian Reservation and that he has been in the employ of the Government on the Reservation. He first went there in the fall of 1874 and he has been there, in and out, until about the latter part of the Eighties. Witness states that he is familiar with the locality now occupied by the town of Cleveland, Oklahoma, though he has not been in that country since it was opened. He states that he has often heard of Turkey Island but could not state positively whether he has ever been on the island. He has worked in the near neighborhood of the island but cannot state how far from it. At the time his work consisted of building houses for the Indians and he was in the employ of the Government. He was down in the [vicinity] of the island in the years '82 and '83 and as late as '85. In the summer of 1883 witness recollects quite a high rise in the river. At the time witness was in that neighborhood in '83 there was a man by the name of "McKinzie" with him and a number of saw-mill hands. Charles Lamb was also there part of the time.

217 The Government here introduced, in connection with Exhibit 3, letter written to Secretary of Interior by W. A. Phillips for the Cherokee Nation, dated March 15, 1883,

and letter from Secretary of Interior to Commissioner of Indian Affairs, dated June 5, 1883, same being Exhibits 3a and 3b and reading:

(Plaintiff's Exhibit 3-A.)

"Mr. Secretary:

To facilitate matters and prevent delay hereafter, I respectfully ask that you send to the Commissioner of the General Land Office for a correct legal description of the lands occupied respectively, by the Osages, Pawnees, Poncas, Nez Perces, Otoes and Missourias such a description as would be required in a conveyance.

The question as to form, etc., can be determined as soon as you can attend to it. The delegation are waiting in the city to attend to this and then go home. The information required above will take four or five days, perhaps longer, and as it will be required in any event, I should be very much obliged if you would give the order for its preparation, so that when you are ready to take up the matter there need be no further delay.

Very respectfully,

W. A. PHILLIPS,
For Cherokee Nation.

Washington, D. C.
March 15, 1883."

218 (Plaintiff's Exhibit 3-B.)

"JKMC

10242

RVB

Department of the Interior

Washington, June 5th 1883

The Commissioner
of Indian Affairs

Sir:

Referring to your report of March 20, 1883, submitting description of the several tracts of lands in the Indian Territory west of the Arkansas River, on which the United States has settled the Pawnees, Poncas, Nez Perces, Otoes and Missourias and Osages, under the provisions of the 16th Articles of the treaty of 1866 with the Cherokee Indians, I transmit herewith drafts of the deeds for the several tracts required by Act of March 3, 1863 to be executed by the Cherokee Nation, which you will have have properly transcribed on parchment and returned to this Department.

The sum of three hundred thousand dollars, appropriated by the Act of March 3, 1883 "to be paid into the Treasury of the Cherokee Nation, out of the funds due under appraisement for Cherokee lands west of the Arkansas River", is held to be a payment on account or part payment of the appraised value of the lands, ceded by the Cherokee Indians to the United States by the 16th Article of the treaty of July 19, 1866, (14 Stat. 804) as fixed by the President in document dated Executive Mansion June 23, 1879.

Very respectfully,

H. M. TILER,
Secretary.

1154 Ind Div. 83
Five Encls''

219 The Government here introduced in evidence the decision of the Secretary of the Interior dated May 29, 1891, said decision being signed by "Geo. Chandler First Assistant Secretary" and reported in Vol. 13, page 653, of the Land Decisions.

Government here introduced part of page 33 of the Manual of Surveying Instructions of the Survey of the Public Lands, under direction of Commissioner of the General Land Office, January 1, 1890, the same being marked Exhibit 12 and reading:

(Plaintiff's Exhibit 12.)

"Meandering.

Sec. 1. Proceeding down a stream, the bank on the left hand is termed the "left bank", and that on the right hand the "right bank". These terms are to be universally used to distinguish the two banks of a river or stream.

Sec. 2. Both banks of navigable rivers, as well as of all rivers not embraced in the class denominated as "navigable", the right-angle width of which is three chains and upwards, will be meandered on both banks by taking the general courses and distances of their sinuosities, and the same are to be entered in the field-book. Rivers not classed as navigable will not be meandered above the point where the average right-angle width is less than three chains.

At those points where either the township or section lines intersect the banks of a navigable stream, or any meander-

able line, corners are to be established at the time of running these lines. These are called "meander corners"; and in meandering you are to commence at one of those corners, coursing the banks or boundary lines, and measuring the "meander corner". By the same method you are to meander the opposite bank of the same river.

The crossing distance between the Meander Corners on same line and the true bearing and distance between opposite meander corners is to be ascertained by triangulation or direct measurement, in order that the river may be protracted with entire accuracy. The particulars to be given in the field-notes."

The Government here introduced its Exhibit 13, letter from Secretary of the Interior to Attorney General and reading:

"Department of the Interior

Washington, Apr 20 1915

Dear Mr. Attorney General:

I have the honor to acknowledge the receipt of a communication of April 16, 1915 (E. K.—168781), from Assistant Attorney General Knaebel, concerning the suits brought at 220 the instance of this Department for the protection of the interests of the Creek and Osage Indians Nations in the title to the bed of the Arkansas River within said Nations, Oklahoma. In these suits the Government is contending that the Arkansas River within the Creek Nation and Osage Nation is not a navigable stream and that the title to the bed of the river is vested in the Indian tribe.

My attention has been invited to an Indian Office letter of March 26, 1908, which was approved on March 27, 1908, by the then Assistant Secretary of the Interior, said letter having reference to an application to take sand and gravel from the Arkansas River within the limits of the Cherokee Nation and in which letter the view was expressed that the Arkansas River throughout its length in said Cherokee Nation was a navigable stream under the laws of the United States and that the title to the bed of said stream was in the State of Oklahoma.

Assistant Attorney General Knaebel inquires as to the view of this Department on the scope and effect of the above mentioned Indian Office letter. Your attention is invited to the fact that the portion of the Arkansas River therein referred to as navigable was only that portion of the river in the Cher-

okee Nation, and which part embraces a lower reach of the river than that affected by the pending river bed suits. I have been unable to find from the records of the Department that it has ever expressed the view that the Arkansas river above the junction of the Grand River was navigable.

When the Creek Nation acquired on August 11, 1852, its title to the territory in what is now Oklahoma, the Arkansas River within said territory of the Creek Nation was considered non-navigable as may be seen from a report of December 20, 1853, of Colonel Long of the corps of Topographical Engineers, a portion of whose report was embodied in the report of Colonel J. J. Abert transmitted on January 27, 1854, by the Secretary of War to the President of the Senate, (Executive Document No. 26 Senate, 33rd Congress 1st Session). From said report it appears that the Arkansas River was navigable only to the junction of the Verdigris and Neosho Rivers, and further, that even such navigability was potential rather than actual. It therefore appears that at the time the Creek Nation acquired its title, whatever navigability the Arkansas River had, it did not extend to any part of said river in the Creek Nation or in the upper reaches beyond.

In my letter to you dated December 12, 1913, relative to the question of the institution of suit for the protection of the title and interests of the Creek Nation in and to the beds of the Cimarron and said Arkansas Rivers, I expressed the view that under the provisions of the various treaties with the Creek Nation and of the patent of August 11, 1852, said Creek Nation acquired title not only to the uplands, but also to the river beds included within its territory, and further, that said title having been acquired by the Creek Nation prior to the creation of the State of Oklahoma, there was nothing in the law admitting said State to the Union which was intended to deprive the Creek Nation of its property right.

221 This Department contends that the title of the Creek Nation to the river beds in question does not depend upon their navigability or non-navigability. As to the status of the Arkansas River in the Creek Nation as a non-navigable stream and as to the title of the Creek Nation to the bed of said river, your attention is especially invited to the brief filed on behalf of the United States by the United States Attorney for the Eastern District of Oklahoma in the United States Circuit Court of Appeals for the Eighth Circuit in the case of the United States, appellant, vs. Phillip Mackey, et al, appellees.

It is apparent from the above and from the brief filed on behalf of the United States in said Mackey case, that the view expressed by the Indian Office in its above mentioned approved letter of March 26, 1908, was erroneous, being based upon a misconception as to the facts, and a misinterpretation of the views of the Supreme Court of the United States as expressed in its decision in the case of *Shively vs. Bowlby* (152 U. S. 1). Said communication is not in accord with the views of the Department as to the status of the bed of the Arkansas River or as to the title thereto.

The report made by the Department in 1889 (Senate Ex. Doc. #120, 50th Congress, 2nd Session), does not discuss the question of navigability of the Arkansas River or the ownership of the river bed along or across the lands of the Five Civilized Tribes. The position of the Department, in the case of *Kansas vs. Colorado* (206 U. S. 46, 86), was, as stated by the Court, "that the Arkansas River is not now and never was practically navigable beyond Fort Gibson in the Indian Territory." The report transmitted to the Senate on January 27, 1894, states that the Arkansas River was navigable only to the junction of the Verdigris and Neosho Rivers. The point fixed by the Government in the Kansas-Colorado case was Fort Gibson. The portion of the Arkansas River referred to in the Indian Office letter of March 26, 1908, is that part in the Cherokee Nation. The junction of the Verdigris River and the Grand River with the Arkansas is at Fort Gibson. Immediately above the junction the Arkansas leaves the Creek Nation entering the Cherokee, and at the junction changing its course to a southerly direction. As to the navigability of the Arkansas River on the boundary of the Osage Indian reservation, Oklahoma, your attention is invited to my letter to you of March 31, 1915, in response to Assistant Attorney General's Knaebel's communication of March 20, 1915, (E. K. C. S. E. 159932-51).

Cordially yours,

FRANKLIN K. LANE.

The Honorable The Attorney General.

Inclosure No. 15870."

The Government here introduced as Exhibit 14 the following statement from statistics on page 418 of the Eleventh Cen-

sus Reports of the United States, 1890, under "Statistics of transportation by water." Said statement reads:

222 "Already the country contributing to the commerce of the Arkansas river has considerably increased, and it has been calculated that with the further improvement of this river the vast acreage of Indian territory and the products of the large extent of Kansas will find Fort Smith or Little Rock its eventual water outlet. Commencing at the head of navigation on the Arkansas and then following down through the fertile valley tributary to it, the cities of Wichita, Arkansas city, Fort Smith, Dardanelle, Little Rock, and Pine Bluff, 6 of the largest cities in the valley, which, together with their surrounding counties, have a population of over 400,000 inhabitants, depend very largely for their commercial growth and prosperity on the outlet furnished by this river, which in the census year carried 1,663,817 tons of freight. With the continued improvement of this river freights will be still further reduced, fully another million tons of freight will be transported, and the counties of Butler, Chautauqua, Cowley, Elk, Harper, Kingman, Sedgwick, and Sumner, all in Kansas, will be brought into tribute."

The Government here introduced as Exhibit 15 the following from page 2041 of Captain H. S. Tabor, Corps of Engineers, in charge of the Little Rock office, from a part of the annual report of the Chief of Engineers of the United States for 1891: "For general summary of commerce, see that under head "Removing obstructions in Arkansas River, Arkansas, Indian Territory, and Kansas".

Further details may be summarized as follows: Commencing at the head of navigation on the Arkansas River, thence following down through the fertile valley tributary to it, we have Wichita, Arkansas City, Fort Smith, Dardanelle, Little Rock, and Pine Bluff, six of the largest cities in the valley, which, together with their surrounding counties, have a population of over 400,000 inhabitants. The commercial growth and prosperity of these cities demand an outlet by way of this river. The following table, which has been compiled from statistics and letters from prominent business men of each of these cities and Territories, shows over 1,000,000 tons of

freight that will be cheapened by the improvement of the Arkansas River:

Tonnage.	Tons.
Arkansas City, Cowley County, Ark.	429,036
Fort Smith, Ark.	51,526
Dardanelle and vicinity	21,850
Little Rock	689,476
Pine Bluff	509,828
Total	<hr/> 1,701,716 tons''.

Also on page 2042:

"If it is proposed to extend this question to Kansas as tributary to the Arkansas River, for a natural outlet for commerce, the following would figure, viz:

Tonnage of Butler, Chautauqua, Cowley, Elk, Harper, Kingman, Sedgwick, and Sumner, Counties, Kans., for the years 1883 and 1884.

Wheat	183,638 Tons
Corn	553,509 "

The Government here offered in evidence, as Exhibit 16, article on page 111 in volume 14 of "Transactions of Kansas Academy of Science", reading:

223 "A Dying River.

By J. R. Mead, Wichita.

The Arkansas is the largest river in the state of Kansas and was considered a navigable river to the mouth of the Little Arkansas by the United States government. When the county was surveyed its banks were meandered, leaving a river bed of 800 or 1,200 feet in width as the property of the general government, and to some extent the river was used in Kansas as a highway of travel and traffic until the coming of the white man, who robbed it of its water, and exterminated the millions of bison and other forms of animal life which once grazed on the bordering luxuriant meadows and quenched their thirst in its rippling waters. The writer's observation of the rivers of Kansas only extends back to 1859. At that time, and until some years after the settlement of the country, the Arkansas was a river in fact as well as in name, usually flowing from bank to bank. From Mr. William Matthewson, a noted plainsman, I learn that as early as 1852 boats were

built at Pueblo, Colorado, in which mountain traders and trappers, sometimes in parties of 15 or 20 in one boat, with their effects, floated down the swift current of the river to Arkansas, and from 1870 to 1880 boats were built at Wichita to descend the river, some propelled by steam; in one instance two young men built a boat at Wichita and navigated the river and gulf to Florida.

At that time the river had apparently pursued its accustomed way unchanged for centuries; it had well defined banks, with a width of 800 to 1,200 feet, the river very seldom overflowing the valleys, but a few feet higher than its level. From the state line up to the present county of Reno heavy timber fringed its banks. Occasionally the river was a dry bed of sand above the mouth of the overflowing Little Arkansas for a couple of months in the fall. The country adjacent to the Arkansas for many miles on either side is underlaid by a bed of sand in which the waters of the river disappear in
224 a season of drouth, except in deep holes which were below the level of the underflow. Fish gathered in those holes in great numbers, and herds of buffalo traveled up and down the sandy bed hunting for water. Suddenly the sandy bed would again become a river, the rushing water coming down with a front of foam two to three feet deep. The river was dry in the falls of 1863 and 1865. In 1867 came a great flood; the river was bank full all the season, and overflowing the adjoining low valleys. Indians crossed their families in tubs made of a single buffalo hide, and swam their horses, and the writer saw a four mule team and heavy freight wagon swept away by the swift current. But little sediment was deposited in the overflowed lands, but the boiling, rushing water was constantly moving the sandy river bed towards the Gulf. There was no opportunity for the formation of islands; the sand bars were constantly changing and moving down stream.

Before the settlement of the country the bordering plains were tramped hard and eaten bare by innumerable buffalo, allowing the rainfall to speedily flow into the ravines and creeks, thence to the river as from a roof. The breaking up of the soil consequent upon the settlement of the country allowed the rainfall to soak into the ground, and the river soon ceased to carry its usual volume of water, not noticeable until about 1880. In addition to this, numerous irrigating ditches were dug in western Kansas and Colorado, sufficient at the present time to divert the entire water of the river to the thirsty plains. Thus for the past 10 or 15 years we have observed the evolution of a great river into a sandy waste or insignifi-

cant stream. Nature has undertaken to accomodate itself to the changed conditions. The once moving sandbars become fixed, and are speedily covered with young cottonwoods and willows from seed sown by the wind. They grow rapidly, binding the soil with their roots. When a freshet occurs it is not of sufficient duration to undermine and wash away the embryo island, but deposits several inches of mud and sand among the young trees; these thrive and grow rapidly. The wind blowing the sand from the dry river bed aids in building up the island. By the time another freshet comes down the islands are firmly established, soon become groves of timber, gaining in elevation and solidity each year. In time the upper end of the islands become connected with the shore, forming a lagoon, which soon fills with a slimy, slippery blue clay, known locally as hardpan or gumbo. This process explains the spots and streaks of this substance found in the Arkansas Valley. An illustration of this formation can be seen at the mouth of the Little Arkansas river, where formerly was a long, narrow lake of considerable depth and of pure, clear water, the wintering place for huge cat, buffalo and other fish. By the diversion of the water of the little river into Chisholm creek, for milling purposes, this lake became a stagnant pool, into which the muddy water of the big river backed each time it came down in a flood, where the sediment settling to the bottom, formed a mass of so little consistency that an oar or a boat would pass through it almost as easily as through water; but after the flood had subsided, leaving it to solidify and dry, it became almost as firm as a rock and as tough as leather, not "adobe" soil, but "gumbo". Thus was destroyed the wealth of molluscan life for which our river was noted. The beautiful minnows, anodontas and margaritinas have disappeared from their favorite home.

During most of the year 1893 the Arkansas river above the junction of the little river has been entirely dry; below that point it is an insignificant stream which a school boy can roll up his pants and wade across. In a comparatively short time, in southern Kansas, timber will occupy the former site of the Arkansas river, through which will flow a stream a few rods wide.

This wonderful change has been brought about by our so-called civilization within the last 15 years. Fortunate indeed are those who were permitted to behold the beauties of this valley and river when it was the home of the Indian and buffalo—just as God made it."

225 Here the Government called the courts attention to the following Acts of Congress.

Act of March 3, 1879, 20 Stat. 366, for improving Arkansas River between, Fort Smith, Arkansas and Wichita, Kansas, \$20,000.00.

Act of June 14, 1880, 21 Stat. 187, improving Arkansas River between Fort Smith, Arkansas and Wichita, Kansas, \$15,000.00.

Act of March 3, 1881, 21 Stat. 477, improving Arkansas River between Fort Smith, Arkansas and Wichita, Kansas, \$24,000.00.

Act of August 2, 1882, 22 Stat. 202, improving Arkansas River Arkansas and Kansas, continuing improvement between Fort Smith and Wichita, \$20,000.00.

Act of August 5, 1886, 24 Stat. 323, improving Arkansas River Arkansas, and continuing improvement, \$75,000.00 according to the plan and recommendations in Appendix B, 13 Executive Document 1, 49th Congress. \$8,000 at Pine Bluff; \$13,000 at Fort Smith; \$10,000 at Dardanelle, or so much of those sums as may be necessary at these points. For the removal of sands, rocks, and other obstructions in Arkansas River \$19875, of which sum \$1125 or so much thereof as may be necessary shall be used to complete the survey of the Arkansas River between Little Rock, Arkansas and Wichita, Kansas.

Act of August 11, 1888, 25 Stat. 415. Improving Arkansas River, Arkansas, \$150000, provided nothing herein contained shall authorize the Secretary of War to enter upon the project of improving the said river as set forth in the report of the board of engineers on improving the Arkansas River from Wichita, Kansas to its mouth, dated New York City, March 16, 1888, and contained in House Executive Document number 234, 1st session 50th Congress.

Act of September 19, 1890, 26 Stat. 445.

Act of July 13, 1892, 27 Stat. 103.

Act of August 18, 1894, 28 Stat. 353.

Act of June 3, 1896, 29 Stat. 223.

225½ Act of March 3, 1899, 30 Stat. 1141.

Act of June 13, 1902, 32 Stat. 357.

Act of March 3, 1905, 33 Stat. 1132.

Act of March 2, 1907, 34 Stat. 1092.

Act of June 25, 1910, 36 Stat. 651.

Act of February 27, 1911, 36 Stat. 945.

Act of July 25, 1912, 37 Stat. 214.

Act of March 4, 1913, 37 Stat. 814.

Act of March 4, 1915, 38 Stat. 1055. Section 14.

226 Here was introduced in evidence account of journey down Arkansas River in 1806, of Lieutenant Wilkinson contained on pages 546 to 556, Vol. 2, of Expeditions of Zebulon M. Pike by Dr. Elliott Cowles, said account being in report of said Lieutenant Wilkinson to General James Wilkinson at New Orleans, Louisiana on April 6, 1807.

(Plaintiff's Exhibit 17.)

"On the 17th it commenced raining and continued for several days, during which time the river rose so much as to fill its bed from bank to bank. Lieutenant Pike having determined that I should descend the Arkansas, we cut down a small green cottonwood, and with much labor split out a canoe, which being insufficient, we formed a second of buffalo and elk skins.

After the rain had ceased the weather became extremely cold, and on the 27th, in the evening, a severe snow-storm commenced and continued nearly all night. In the morning (of the 28th) the river was almost choked with drifting ice; but the sun bursting out at noon, the ice disappeared, and I took leave of Mr. Pike, who marched up the river at the moment I embarked on board my newly constructed canoe. Unfortunately, we had not proceeded more than 100 yards when my boards grounded, and the men were obliged to drag them through sand and ice five miles, to a copse of woods on the southwestern bank. I here hauled up my canoe, formed a kind of cabin of it, and wrapped myself up in my buffalo-robe, disheartened and dissatisfied with the commencement of my voyage. The night was severely cold, and in the morning (29th) the river was so full of ice as to prevent all possibility of proceeding. The day continued stormy, with snow from the northwest.

On the 30th the river was frozen up, and toward evening the water had run off and left the bed of the river covered with ice. This circumstance determined me to leave my canoes and course the river by land. Accordingly, on the 31st of October, after having thrown away all my clothing and provisions, except half a dozen tin cups of hard corn for each man, I slung my rifle on my shoulder, and with my buffalo-robe at my back and circumferentor in my hand, recommenced my march with a light and cheerful heart. My only apprehension was that I might meet with detached bands of Pawnees, who, I am confident, would have brought me and my five men (Ballenger, Boley, Bradley, Huddleston, Wilson) to action; and what the consequence of this would have been is very obvious.

On the 1st, 3d, and 3d of November I marched over high and barren hills of sand; at the close of each day passed strongly impregnated salines, and perceived the sores of the river to be completely frosted with nitre. The face of the country, as I descended, looked more desolate than above, the eye being scarcely able to discern a tree; and if one was discovered, it proved to be a solitary cottonwood, stunted in growth by the sterility of the soil. The evening of the 3d instant I encamped on the bank of the river, without a tree or even a shrub in view. On the 4th we experienced a heavy rain; but hunger and cold pressed me forward. After marching 10 miles I reached a small tree, where I remained in a continued rain for two days (5th, 6th), at the expiration of which time, having exhausted my fuel, I had again (7th) to push off in a severe storm, and formed my camp at the mouth of a bold running stream (probably Cow Creek), whose northern bank was skirted by a chain of lofty ridges.

On the 8th, in the morning, it having cleared up, I began my march early, and it appeared as if we had just gotten into the region of game; for the herds of buffalo, elk, goat
227 (antelope), and deer surpassed credibility. I do solemnly assert that, if I saw one, I saw more than 9,000 buffaloes during the day's march.

On the 10th, in the evening, after a severe day's march, I encamped on the bank of a large creek (probably Little Arkansas), and discovered for the first time on the river a species of wood differing from the cotton tree. I assure you the sight was more agreeable than a person would imagine; it was like meeting with an old acquaintance from whom I had been separated a length of time. I even began to think my

self approximating civilized settlements, although I was just entering on the hunting-ground of the Osages.

The buffaloes and goats disappeared on the 12th, or rather we had passed their range and entered that of the deer only. Our marches were through rich narrow bottoms from 150 to 200 yards wide.

On the 15th, discovering timber sufficiently large to form canoes, I felled a couple of trees, and commenced splitting out. I would have proceeded further by land, but as my men were almost worn out with fatigue, and as the game grew scarce, I conceived it most advisable to rest for a short time, and kill my winter's store of meat. This I effected by the 24th, and on the same day completed the canoes. On the 25th I again attempted the navigation of the river, but was as unfortunate as at first; for my boat grounded, after floating a few hundred yards, and the men were consequently compelled to play with their shoulders instead of their paddles.

The following day I passed the Negraeka (read Ninneseah), at whose mouth commence the craggy cliffs which line a great part of the shores of the Arkansaw.

On the 28th the provision canoe upset, and I lost nearly all my stock of meat; this accident was rendered the more distressing by an almost total loss of my ammunition, which unfortunately was in the same canoe.

* * * * *

Before I set out to visit Tuttasuggy, the ice had commenced drifting in large sheets, and on my return I found it running from short to shore. However, I pushed off and drifted with it.

The night of the 2d of December was intensely cold, but hunger obliged me to proceed, and we fortunately reach the mouth of the Neshalonska (Salt Fork of the Arkansaw) river without accident or injury, excepting that one of my men got frosted. This day we passed two salines which enter on the southwestern side.

The severity of the weather increased, and the river froze over on the morning of the 3d. This circumstance placed me in a situation truly distressing, as my men were almost naked; the tatters which covered them were comfortless, and my ammunition was nearly exhausted. The men solicited me to hut, but I was resolved by perseverance and exertion to overcome, if in my power, the obstacles opposed to my progress.

The Neskalonska is about 120 yards wide, shoal and narrow at its mouth, but deepens and spreads after you turn the first point. On this stream the Grand and Little Osages form their temporary fall hunting-camps, and take their peltries. When the severity of winter sets in, the Grand Osages retire to Grosse Isle, on the Verdigrise or Wasetihoge; and the Little Osages to one of its small branches called Possitonga, where they remain during the hard weather, and thence
 228 return to their towns on the Neska or (Little) Osage river.

On the 6th the ice began to drift, and I immediately pushed off with it; but as my evil stars would have it, my boats again grounded. Being in the middle of the river, my only alternative was to get out and drag them along for several miles, when we halted to warm our benumbed feet and hands. The next day several large cakes of ice had blocked up the river, and we had to cut our way through them with axes; the boats as usual grounded, and the men, bare-legged and bare-footed, were obliged to leap into the water. This happened so frequently that two more of them got badly frosted.

229 Government here offered in evidence a part of the account of S. H. Long's Expedition, Volume 4, published by Arthur H. Clarke Company in the edition of 1905, pages 139-40, as exhibit 18, reading as follows:

(Plaintiff's Exhibit 18.)

Proceeding eastward along the river, its valley gradually widens, and the bluffs or banks by which it is bounded become less elevated and abrupt. The bottoms rise but few feet above the water-level of the river, but the freshets, having a broad bed like that of the Plattento expand upon, seldom rise so high as to inundate the bottom. This part of the Arkansas, as before hinted, cannot be considered as navigable, except for boats of light burden during the prevalence of a freshet. In a very low stage the river is said to disappear in many places, the (230) whole of its water passing of through the immense body of sand of which its bed is composed. The Arkansas, having a direction nearly east and west, has no great variety of climate to traverse in its course from the mountains to the Mississippi; consequently there is no succession of thaws taking place upon the river, calculated to maintain a freshet for any considerable length of time. The freshets are occasioned by a simultaneous melting of the snow throughout the whole extent of the river, and by show-

ers of rain, which, falling upon a rolling surface, is quickly drained off, and causes sudden, but seldom excessive rises in the river. I have witnessed, in the Arkansas, no less than three considerable rises and falls of the water in the course of two weeks.

Government here offered, as exhibit 19, the following from Senate Executive Document Number 26, Thirty-third Congress, first session, reading:

“The Arkansas river is navigable only to the junction of the three forks distinguished by the names of the Arkansas, Verdigris and Neosho, viz: a little less than 600 miles from its mouth. Its channel throughout this portion of the river, is, for the most part, narrow and very crooked; its current rapid, corresponding to an average declivity of about eight inches per mile; its bars at every bend, and are composed of sand and gravel, firmly compacted; rocky reefs extending quite across the channel, are of frequent occurrence, 230 on the upper half of the navigable portion while snags and logs of large size, and deeply imbedded in hard bars, are abundant, especially in the lower half.

The proper season for prosecuting the snag business on this river commences about the 1st of April and terminates about the last of July.

A rise occasionally takes place in October or November, but seldom continues long enough for successful operation with the snag boats.

During the last season the snag boat No. 4 entered the Arkansas early in August, and succeeded in removing the snags from the low water channel, through a distance of about sixty miles upwards from its mouth. In attempting to retreat from the river, this boat grounded on a bar a little below the White river cut-off, and was detained in consequence an entire month, or thirty-one days.

It is proper to observe in this place that the craft best adapted to the removal of snags, etc., from the Arkansas, is as follows, viz: A light draft snag boat, with single hull, accompanied by one or more machine boats, of the usual construction, the latter being susceptible of towage from place to place by the former.

The channel of the river, especially in low water, is too narrow and crooked, and the current too rapid, to admit of

the successful operation of a twin snag boat of the usual size; although in an elevated stage of the river, such a boat may operate to great advantage."

(Signed) A. A. ABERT,
Colonel Corps Topographical Engineers.

January 23, 1854.

House Document, number 129, Thirty-third Congress, first session, the report of the Secretary of War, page 21, marked exhibit 20, is read as follows:

(Plaintiff's Exhibit 20.)

"A ride of 18 miles, over a country in all respects like that of yesterday, brought us to the Arkansas River, where we found two hundred and eighty lodges of Comanches encamped, their horses and mules in large droves grazing far and wide over the river bottom. Hosts of men, women and children immediately surrounded us, as we passed their female sentinels, upon the bluff near the river. Some of their chief men accompanied us to camp, out of courtesy and respect to the party and government, liberal presents being expected in return. Camp was pitched a mile west of Fort Atkinson, where we found an abundance of grass, but were indebted to Major Chilton, 1st Dragoons, commanding at the Fort, for a supply of fuel for cooking or bacon and coffee, the river bank here being destitute of drift-wood for many miles above and below. The river is unusually high, being from one hundred and fifty to two hundred yards wide; and the Indians, in crossing it, are occasionally seen swimming; while two years ago, at this season, I am told by officers of the army and others who were then here, that it was necessary to dig in the bed of the river for water to drink. This sinking of the stream during low stages of water is not peculiar to the Arkansas, as is well known, and it is believed that water can be found always in abundance by digging in the bed of this stream. July 16th."

Senate Executive Document, number 120, Fiftieth Congress, second session, marked exhibit 21, is read as follows:

"It must be remembered that the Upper Arkansas, the North Platte and the South Platte are not navigable streams. They are all exceedingly broad, muddy rivers, having great declivity, and so shallow as to be practically impassable for

even canoes during the greater part of the year. They are thin sheets of mud tumbling down a highly-inclined plane; so that the interests of navigation are in no way affected by the use of these streams for agriculture."

Government here offered as exhibit 22 the following from report on the Mississippi River, printed as Professional Papers of the Corps of Engineers, number 13, reading:

"The following facts respecting the Arkansas between the big bend and Fort Smith are taken from the report of Captain Bell, who led a detachment of Major Long's party down the left bank of the Arkansas in 1820."

Below the Cimarron 'we were all immediately struck with the change in the appearance of the water of the river. No longer of that pale clay color to which we have been accustomed, it has now assumed a reddish hue hardly unlike that of the blood of the human arteries, and is still perfectly opaque from the quantity of an earthy substance of this tint, which it holds in suspension; its banks and bars are, from deposition,

of the same color.' A few miles farther on, he states:
232 'The prairie is now very fertile, interspersed with the pleasing groves of oak, and swelling on either hand and in the distance into remarkable pyramids and conical hills, of which the summits are rocky. The spice-wood (*laurus benzoin*) and the pecan (*Carya oliviformis*) first occurred today.' This character of country extends to Fort Gibson which is situated at the head of navigation."

Government here offered, as exhibit 23, part of letter of the Secretary of War, transmitting to the House of Representatives, in answer to a resolution thereof, of May 12, 1870, a copy of the report of S. F. Avard on the survey of the Arkansas River, contained in House Executive Document number 295, Forty-first Congress, second session, reading:

"The Arkansas River rises in the gold regions of Colorado. Its source is placed by Lieutenant Pike and Major Long in latitude 39° north, longitude 106° west, at an altitude of ten thousand feet above the level of the sea. In the first part of its course it possesses the character of a mountain torrent. By a succession of falls and rapids it achieves a descent of five thousand feet in a distance of one hundred and fifty miles.

Leaving a country of woods and pastures, it enters the salt plains of Kansas. Here the water becomes brackish, and be-

low the mouth of the Cimarron, assumes a blood-red color. Between Little Arkansas and Fort Gibson, pastures and woods become abundant, and the country is intersected with ravines.

In the upper part of its course, the river is fordable at ordinary stages.

After passing the broken country of the Ozark Range, bearing northeast and southwest, the military post of Fort Gibson is reached, at a distance of five hundred and forty miles from the mouth of the river. Here the practical work of the survey began.

The post of Fort Gibson is situated in the Grand or Neosho River, two miles above its junction with the Arkansas. It overlooks a basin-shaped area of cultivated land and prairie, bounded on the north and east by hills of sandstone, and on the south and west by the Ozark range. At the mouth of Grand River, the road for the transportation of military stores to the recently established post in the Wichita Mountains crosses the Arkansas. The Verdigris River enters about [half] a mile above."

Tributaries

Grand or Neosho River is navigable for sixty or eighty miles for small steamers, but the short duration of the flood renders navigation uncertain. The current is rapid and requires more power to overcome it than the small steamers usually possess. Lead miners on the river offer high prices to induce steamboat men to make the venture.

The Verdigris River cannot be navigated for more than ten miles, nor the Arkansas above its junction with this stream.

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(Plaintiff's Exhibit 24.)

House Executive Document, No. 94, 45th Congress, Third Session, beginning on page 8 of the exhibit, which reads as follows, **to-wit:**

240 Examination of Arkansas River, from Fort Smith, Arkansas, to the Mouth of Little Arkansas.

United States Engineer Office,
Saint Louis, Mo., February 5, 1879.

General: In accordance with your instructions of July 8, 1878, I have caused a reconnaissance to be made by Mr. J. D.

McKown, assistant engineer, of the Arkansas River from the mouth of the Little Arkansas to Fort Smith, and a copy of his report thereon is herewith submitted.

Owing to the very small sum allotted to this work, only a hurried reconnaissance was possible, but a good idea was obtained of the character of the river and its capacity for improvement.

The whole length reported on is about 409 miles, of which the upper portion, 70 miles long, affords a low-water depth over the numerous sand bars of about 6 inches. The remaining portion has a navigable low-water depth of about 12 inches, but the channel is much obstructed by snags. There are also some localities where the removal of rock would be necessary.

In addition to the natural obstructions there are three bridges unprovided with draws, and of course impassable for steamers.

Except in the upper portion before mentioned, the navigable low-water depth is about the same as that of the Arkansas River between Little Rock and Fort Smith, and it would of course be useless to attempt to get a greater depth until the balance of the stream was correspondingly improved.

The estimates presented by Assistant McKown are for removing snags and rocks and so contracting the widths of the stream as to give at low-water a depth of about 2 feet, but this estimate is only a rough approximation at the best, and no work on this scale should be undertaken, even if deemed advisable, until a thorough survey of the stream has been made, the cost of which is estimated at \$16,360.

I am, however, of the opinion that by removing the snags and constructing slight dams at some of the worst shoals the navigation would be so improved as to render it as good as that between Little Rock and Fort Smith, and this would seem to be all that is worth doing until the general improvement of the river is undertaken. The cost of this work would be about \$100,000, which could be expended in one season.

I am, general, very respectfully, your obedient servant,

CHAS. R. SUTER,
Major of Engineers.

Brig. Gen. A. A. Humphreys,
Chief of Engineers, U. S. A.

Report of Mr. J. D. M'Kown, Assistant Engineer.

United States Engineer Office,
Saint Louis, Mo., January 27, 1879.

Major: I herewith respectfully submit the following report of the examination of the Arkansas River from the mouth of the Little Arkansas River to Fort Smith.

In accordance with orders received from this office, I proceeded to Wichita, Kans., and commenced the examination of the river at the mouth of the Little Arkansas.

The latter stream empties into the main river a short distance above Wichita; part of the water is diverted from the natural channel to supply a mill, but again comes into the main river some $2\frac{1}{2}$ miles below the city. The Arkansas River is very tortuous in its course, that portion from Wichita to Arkansas City passing through a prairie country, and has very little timber on the banks, a thin growth of cottonwood and willows prevailing.

241 The bed of the stream is very wide for the amount of water running, and is of a light sandy nature, quicksand prevailing in a large degree. In many places where the current is strong there is a thin layer of gravel over the sand, which once broken through shows the soft sand underneath.

As we go down the river rock becomes somewhat frequent, rock ridges often crossing the stream, sometimes almost amounting to rapids, and leaving but little room for the passage of boats at low-water.

I had the advantage of seeing the river at a very low stage of water and in its worst condition. At no time during the examination was there a rise of more than 6 inches, and that lasted but a few days.

The distance from Wichita to Fort Smith I estimate at 409 miles, divided as follows:

	Miles.
From Wichita to Arkansas City	65
From Arkansas City to the State line	14
From State line to Grand River	236
From Grand River to Fort Smith	94
Total	409

The small amount of money available rendered rapid work necessary, and a hurried reconnaissance was all that could be

made. On such information as I could obtain, I respectfully submit the following approximate estimate of the cost of improving the river for steamboat navigation at low-water.

The Little Arkansas River empties into the Arkansas about $\frac{3}{4}$ of a mile above the bridge at Wichita. The bed of the main stream is from 600 to 800 feet wide from there to the bridge. The slope of the river from the mouth of the Little Arkansas to a point 1 mile below is 3.03 feet; high-water mark at Wichita from the best information obtainable is 7.45 feet above low-water. The bridge at Wichita has the lower choru 10 feet above low-water, but as the landing would probably be below it, it need not be taken into consideration.

From Wichita to El Paso, a distance of some 15 miles, the slope of the river is about 3 feet per mile, or 45 feet for the whole distance. The bed of the river is generally wide, and to within 2 miles of El Paso needs a continued series of dikes and dams to contract it to a proper width, which would be about 150 feet. This would take a dike of 600 feet every half mile for 13 miles, or 7,800 feet in all. About 2 miles above El Paso the river narrows down to about the required width, with not less than 3 feet of water in the channel. This extends for nearly two miles.

About $\frac{1}{2}$ mile above El Paso there is a rocky reef extending across the river, running out from the left where there is a rocky bank. The expense would be but slight to place it in good boating order—\$2,500 would be sufficient.

From El Paso to Oxford the distance is 25 miles. The difference of level between the two places is about 69 feet, giving a slope of 2.75 feet per mile. This piece of river is a continued series of comparatively short bends, and the water being forced on the convex side of them, forms a good channel in most places. It will require about 78,000 feet of dam for this distance, or 312 feet per mile.

About $1\frac{1}{2}$ miles above Oxford there is a brush and rock dam which is built for the purpose of throwing in a race or ditch, where it is used for mill-power. The dam is a slight, irregular-built affair, angling down stream.

The difference of level of the water above and below it at the left bank is 1.37 feet. The right bank here is about 40 feet high and of talcose slate.

At Oxford there is a ponton bridge. A roadway built to it is made of rock, brush, and prairie hay, the latter predominating, and seems to make an excellent dike, closing the river in to about 150 feet, and making a good channel along the bluff for about a half mile.

Some 4 miles above Oxford the Ne-Ne Seah Creek empties into the river, adding something to the volume of water.

Brush for mattresses is quite scarce on the river from Wichita to this place; but there is but little doubt that the tall, rank prairie grass, which is indigenous to this region, and grows in great abundance, could be used to advantage in the work by mixing it in with the brush, and in all probability would be economical.

About $\frac{3}{4}$ of a mile below Oxford the river widens out and is full of bars. At 5 miles from Oxford, the banks on the right are high and contain considerable loose slate. The river bottom is of rock, but there is a fair depth of water—from $2\frac{1}{2}$ to 6 feet. About 14 miles above Arkansas City, the banks on the left are about 30 feet high, of sand and clay, underlaid with loose rock.

The slope of the river from Oxford to Arkansas City, a distance of 25 miles, is 65 feet, or 2.6 feet per mile. There will be necessary for this piece of river about 16,500 feet of dike and dam—660 feet per mile. The approximate amount of water in the river at Arkansas City is 675 cubic feet per second. At this place there is a wagon-bridge about 600 feet in length, with the lower chord 20 feet above low-water.

H. Ex. 94—2

242 A draw would be necessary to allow the passage of boats. In the present state it is an obstruction to navigation.

From Arkansas City to Kaw Agency the distance is 44 miles. The fall of the river between these points is 110 feet, or 2.5 feet per mile.

It will take about 16,500 feet of work to improve this part of the river, or 375 feet per mile.

The river banks are becoming better timbered, and the river improving. Walnut Creek empties about 7 miles below Arkansas City and adds a fair amount to the volume of water in the river.

Below the creek the river changes somewhat in character. The banks and bluffs are higher and more rocky, the bed of the river more narrow, and timber more plentiful. Oak, hickory, pecan, walnut, hackberry, and many other varieties are common. Cottonwood, of course, is always to be found on the banks and low grounds. Below, and near the State line, and a few miles farther down, about the mouth of Chaloca Creek, a quantity of loose rock, apparently piled up during freshets, shows itself in the river. Some of this rock should be removed and a dam thrown in to concentrate the water. About \$3,000 would do it.

On this piece of river, from Kaw Agency to Salt Creek, the distance is 62 miles. The slope of the river is 136 feet, or about 2.2 feet per mile. It will take about 28,000 feet of dam to improve it, or 451 feet per mile. On this part of the river snags are becoming more plentiful. Between Kaw Agency and Salt Creek the Salt Fork empties; it throws in considerable water.

From Salt Creek to Black Bear Creek, a distance of 15 miles, the river is wide and bad, and will take about 14,000 feet of dam to improve it, or 933 feet per mile. The slope is about 2.2 feet per mile, or 33 feet for the distance of 15 miles. Black Bear Creek comes in on the right, and adds something to the amount of water in the river, even when very low.

From Black Bear Creek to the Cimarron River the distance is 62 miles. The bed of the river is very wide and sandy, sometimes getting as wide as 2,000 feet. It will take some 20,500 feet of dam to improve his part of the river, or 500 feet per mile. The slope of the river is about 1.8 feet per mile, or 112 feet for the distance of 62 miles.

The Cimarron or Red Fork of the Arkansas comes in on the right, and contributes a considerable amount of water to the main river. Its deep red tinge is in strong contrast with the muddy water of the Arkansas, and the waters running side by side some distance before mingling have a marked and unique appearance.

From the Cimarron to the mouth of the Grand River the distance is 87 miles. The slope of the river in this distance is about 152 feet, or 1.75 feet per mile. It will take about 38,000 feet of dam to improve this portion of the river, or 437 feet per mile.

About 3 miles above the mouth of the Grand River, is the bridge of the Missouri, Kansas and Texas Railroad. The

length is 800 feet; there are four spans of 200 feet each, and the lower chord is 34 feet above low-water. The bridge is a strong and handsome structure, built of wood and iron. It has no draw, and may be considered an obstruction.

About $\frac{1}{4}$ of a mile above the mouth of the Verdigris empties and makes quite an addition to the volume of water. The Grand River discharges still more than the Verdigris, and together they make a very perceptible difference in the main stream.

Below the mouth of the Grand, the river changes very much in its character. The bed of the river is not so wide, the channel much better, and the bars and banks contain more gravel.

From the mouth of Grand River to Greenleaf's Creek, about 28 miles, the river is generally good; 5,000 feet of dam will suffice for this distance, but it is almost impassable in places on account of snags, which in some localities almost fill the water-way.

At Greenleaf's Creek, the river was closed with ice, and the examination had to be abandoned. But as Mr. Abert had made a survey of that part of the river in 1869, his report will give information concerning it. The distance from Grand River to Fort Smith is 94 miles, and I should think that \$150,000 would be sufficient for its improvement.

In the above estimates I have taken the cost of the dams at \$4.50 per linear foot, which I think would be sufficient as most all of the work would be in shallow water.

244 Government here offered, as exhibit 25, the following, appearing on pages 22, 23, 24 and 25 and 34 of the work of Irving Dodge, Lieutenant in the United States Army, entitled "The Plains of the Great West", published by G. P. Putnam Sons, 1877, referring to the Arkansas River and reading:

In April the Arkansas, at Fort Dodge, is a sandy bed, a fourth of a mile in width, and with possibly an average of three or four inches of water. In June, when the mountains send forth their floods of melted snow the river swells, the current increases in power and washes out long channels in the sandy bed. When the banks show a rise of two feet the waters cut channels in the sand five or six feet deep, and covering probably a full third of the distance from bank to bank. At these times the current may be said to be a huge wave of sand surging, rolling, turning, and shifting with incessant ac-

tivity. Where there is six feet of water in the morning, there may be noon be a bar with but an inch. By night the bar may be gone and a deep channel in its place. These channels are from ten to thirty feet wide, with generally perpendicular sides. Some force will set a current in a particular direction across a bar. In a few moments a channel from three to six feet deep is cut, through which the water pours as in a mill-race. A shift or change above diverts the current to some other direction, and in almost as few moments the recent channel is filled up to within a few inches of the surface of the water. As the currents by turns set in almost every conceivable direction with reference to the general course of the stream, so the channels may be parallel, oblique, or even perpendicular to that general course." (pp. 22-23)

It can be readily seen from this description that no permanent ferry is possible on such rivers. Much money was spent, and time lost, in the effort to establish a flying bridge by boats at Fort Dodge. The effort failed of course. The first boat launched in deep water was fast aground in an hour or two, and its wreck now lies imbedded in sand, exactly where the launch took place." (p. 24)

A raft on such a stream would be utterly useless, even could the timber to make it be found. The great danger of these rivers is not only from swift channels and quicksands, but from the great weight of the current, loaded as it is with sand." (p. 25)

The south bank of the Arkansas is bounded by these hills for more than 300 miles. The wide sand-bed of the river itself is in many places perfectly dry for a month or more of each year." (p. 34)

Government here offered as exhibit 26 the following from the annual report of the Chief of Engineers for 1880, to which annual report is annexed the report of the District Officer in charge of the improvement of the Arkansas River under the appropriation of 1879, on page IX of the Chief's report, and page 1466 of the District Officer's Report, reading:

245 19. Arkansas River between Fort Smith, Arkansas and Wichita, Kansas. During the past winter a snag boat was dispatched to this field of operations to remove snags and other obstructions from such of this portion of the river as could be reached. Owing to the lateness of the season, low-water, and the great number of snags which had to be removed to admit the passage of the boat, nothing of im-

portance was accomplished, but the work will be taken up again as soon as the conditions are favorable. In addition it is proposed to begin at the upper end and work during the low-water season from flat boats or the shore, and remove the worst obstructions from that portion of the river lying above the railroad bridge, which has no draw and cannot be passed by a steamboat.

Some repairs were also put upon the dike at Fort Smith, Arkansas, which at last accounts was in good condition and working well.

The officer in charge recommends, to carry out such work as is at once needed, an appropriation of \$40,000, and one of \$16,300 for a survey to develop a plan of permanent improvement."

"Improvement of Arkansas River between Fort Smith, Arkansas, and Wichita, Kansas.

No snag boat of sufficient light draft was available for work in this portion of Arkansas River till the end of the winter, when the new snag boat Chauncey B. Reese was assigned to that field. Owing to the low stage of water, the lateness of the season, and the great number of snags that had to be removed to admit the passage of the boat, but little could be accomplished, and the boat was withdrawn. Operations will be resumed at the first favorable opportunity and carried as high as the railroad bridge, 3 miles above Grand River and 97 miles from Fort Smith. This bridge has no draw and is impassable for steamers of any size.

During the coming season it is approved to set a party at work at the upper end of the district. They will workmat low-water either from flat boats or the banks of the stream, and will remove snags and rocks from the channel, and perhaps build a few dams on the worst shoals. These operations will be carried on as far as the funds available will allow, and will, it is thought, benefit at least flat boat navigation, which, with the impassable bridges below, is all that the stream is now capable of. During the past season the dike built at Fort Smith was found to have settled slightly. It was raised to the proper level, and at last accounts was in good condition and had accomplished perfectly the object intended, that of giving a good and accessible harbor to the town of Fort Smith.

In order to carry on such work as is at once needed an appropriation of \$40,000 will be necessary, and I beg leave to

renew my recommendation of an appropriation of \$16,300 for such a survey as is needed to develop a plan of permanent improvement.

246 Government here offered as Exhibit 27 the following:

Report of J. H. Curtis, February 28, 1881, on the Improvement of Arkansas River Between Wichita, Kansas, and Ft. Smith, Ark.

February 28th, 1881.

I have the honor to make the following report of operations in connection with the improvement of Arkansas River between Wichita and Fort Smith.

In accordance with orders received from Major Charles R. Suter, Corps of Engineers, U. S. A. dated August 23rd, 1880, I set out next day for Fort Smith, Arkansas, and having made an examination of the river and dyke in that vicinity, made a report to Major Suter on the condition of things as I found them at that time; and on the 27th set out from thence for Wichita, Kansas, arriving on the 30th. Here I remained until the 1st of October endeavoring to obtain information in regard to the character of the work and plant necessary to improve the Arkansas River between Wichita and Fort Smith as contemplated in the appropriation made for that purpose,—I found nobody at Wichita who knew anything definite about what was desired nor what kind of an improvement as contemplated. Only a vague idea that something could be done to make a navigable channel, and only a movement leading to the deepening of the water would be listened to. With this pressure of the people and my instructions from Major Suter to “find out just work was to be done” together with verbal instructions to consult with the best informed people of Wichita in the matter, I was thus placed in a position in which I was unable to find out the object of the movement set on foot as I afterwards found by the people of Arkansas City instead of Wichita, at which place I was informed of the object of the present appropriation and of the character of the work desired, on the basis of which I finally submitted plans and estimates in accordance with instructions.

On the 1st day of October last having received instructions to make an examination of the river between Wichita and Fort Smith set out in a small flat bottomed boat with two boatmen. The river was very low and had been so for two years with the exception of the mid-summer rises which had been very slight

and of short duration. The rise of last summer had but just expended itself, and the water going down had out no
 247 channel, leaving a thin film over nearly the entire bed.

A rise of six inches would have submerged the channel, while a fall of that amount would have left the river dry with the exception of pools here and there in the bends. The first day out I succeeded in making ten miles by dragging the skiff most of the way at which all took a hand. The skiff drew about $4\frac{1}{2}$ in. of water. In four days I arrived at the Oxford dam which I found to be a very slight affair running out from the left bank and traversing in very irregular manner working down stream and at last attaching to the right bank, at which point a race carries out the water along the bluff for about two miles to a flouring mill. The dam is a mere assemblage of loose brush and stone, and raised the water along 34 inches at the time I crossed it. After six days in which all hands had assisted in dragging the skiff over innumerable shallows I arrived at Arkansas City: the difficulty was caused not by an absolute want of water, but by the peculiar nature of the stream which does not permit the water to form a channel. When the water subsides after a rise it will maintain about a uniform depth over the entire bed until it gets so low that little skates of bars will appear everywhere. This peculiarity gradually disappeared as I traveled down stream.

On the division of the river in the State of Kansas there has been constructed the following bridges since the reconnaissance of Mr. J. D. McKown in December 1878. A Pile Highway Bridge at El-Paso, $9\frac{1}{2}$ feet above low water. A Pontoon Highway Bridge at Mulvane 8 miles below El Paso. Also at Mulvane a Pile Railroad Bridge (A. T. & S. F.) $9\frac{1}{2}$ feet above low water. At Oxford an Iron Railroad Bridge (K. C. L. & S.) 16 feet above low water.

On the ninth day out from Wichita arrived at Kaw Agency and in seventeen days at the mouth of the Cimarron River, up to this time there was more or less wading and dragging skiff every day, below here this difficulty ended. The Cimarron is the first considerable branch of the Arkansas, yet its visible addition is quite small as it comes tumbling in over a loose sand bar and is of a bright-red color and nearly as salt as sea water. On the twenty second day out I arrived at the mouth of Grand River, the Verdigris River joining the Arkansas $\frac{1}{4}$ mile above, from here down the Arkansas has

all the characteristics of the lower river. On the
248 twenty eighth day I arrived at Fort Smith passing the
mouth of the Canadian on the 25th day out this river
has a small discharge.

All the way down on this trip I kept a careful record of everything that would make an obstruction to navigation as well as making an estimate of the cost of removal of same; and a report was made in conformance with this report. This was submitted to Major Suter on the 6th of November accompanied by a project for the expenditure of the funds available for work: The project was to put in a flat boat with outfit necessary for removing snags, overhanging trees, stumps, drift heaps, loose rock and etc., and in order to hasten the work I looked about with the view of finding somebody who would furnish this outfit together with his own services and thus perform the work at a fixed rate per hour in a manner advantageous to the government—This not being deemed expedient orders were given to provide myself with an outfit, to build such boats as would be necessary, and to hasten the work as much as possible, so on the 22nd of November work was begun on the construction of the necessary boats and in ten days there was finished a flat boat 14 x 45 feet, and another similar one 7 x 18 feet, the last was closed with a cabin and used as an office boat. The former had tents placed on it for the accommodation of kitchen and mess, and carried such tools as were not in actual use, also necessary luggage. Everything being ready a start was made on the 3rd of December with two foremen and fifteen laborers, a carpenter, and a blacksmith. All hands were provided with hip rubber boots. At first a team was employed to assist in transportation, but this was soon dispensed with and some flat skiffs substituted, a large one was used as a workshop, or rather as a means of transportation of mechanics outfit.

Each of the small skiffs was equipped with four men and the necessary tools were divided among the crews, this everything necessary was carried along and no boat drawing over four inches of water. One boat carried a hand crab, tackle blocks snatch blocks and lines, saw and axe; the others were equipped the same with the exception of the crab. The miniature fleet moved down the stream in advance of the large boat, hitching to and removing every obstruction bodily when possible. If in case of a snag which could not be removed with the power at disposal, it was lifted up and cut off as low down

as possible, generally at the bottom of the river. The water being very low the men had little difficulty in wading to any place, and great advantage was thus taken of the work. In the case of submerged bowlders the heavier ones were lifted up by a large steel bar, a grappel was gotten hold of them and with a rolling hitch were lifted out of their beds and carried ashore. There was no trouble in getting out any boulder which could be loosened up; the only difficulty was in starting them. Up to the time the work was closed by ice on the 21 day of December there had been no bowlders encountered which could not be removed. So far bowlders have been met only at El Paso and at the mouth of Bitter Creek about 16 miles below El Paso.

All trees overhanging the channel were removed by being fallen and dragged out, usually they were taken out bodily, but if too large were cut into such pieces as could be taken out by all hands taking hold of a snatch line. This was found to be much quicker than to rig up a tackle block for each tree.

During the time this work was going on from December 3rd to 21st, 1880, it was for the most part a struggle with cold weather and ice; on the 7th, 8th and 9th the river was partly frozen over, afterwards it grew warmer, but on the 21st the ice entirely closed the river, and the party was stopped at a point about forty miles below Wichita. The men while the work was going on pitched and struck tent every day the prairie grass forming a very good bed in the day climate of Kansas.

On the 23rd of December I left the boats frozen in and went to Arkansas City 25 miles below for the purpose of constructing an additional boat for my outfit, this being rendered necessary in order to accommodate my party with a quarter boat and to carry subsistence stores for a three months trip in the Indian Territory or until the Los Vegas trail could be reached where stores could be gotten from Vinita. This boat was made 14 x 70 feet, and was practically finished on the 17th of January. The size of this boat was determined on by considering the necessary load to be carried on a basis of a maximum draught of seven inches.

This boat being finished I returned to my work partly which was in the ice, and five miles distant from the nearest railroad station and post office. The party remained frozen in until the 5th of February, when the ice due to the action of the suns heat broke away sufficiently to permit the

boats being got off the shallow water onto which
250 they had drifted at the time the river closed, from
thence moved down about three miles. Up to this time
the river had been very low and the cold weather unparalleled,
one cold blast from the north after another with the river
frozen for 46 days as unheard of thing in this part of Kansas.
From the best information I could get it was thought that
winter would be the preferable time to begin such a work, as
the delay by ice was not thought worth considering, and in
that season there was an assurance of low water which would
continue until June or July. This prediction had been far
from justified in the actual facts of the case, for the ice had
no sooner given away than there came without a moments
warning a flood of water and ice which in five minutes filled
the river bank full, sweeping everything movable before it,
in which all the bridges on the river were swept away except
the strongest structures. The dam at Oxford was carried
out bodily. This flood occurred on the evening of the 7th of
February and continued until the evening of the 10th three
day, when it suddenly subsided during the night leaving a
covering of three feet of slush ice over the entire bed of the
stream, which trailed through it, showing about the same
volume as before the flood. This was followed by the heaviest
snow storm ever known in that section, succeeded by severe
cold weather which closed the river again. At this point all
work was suspended, and movable property stored either in
Oxford or Arkansas City, and the boats left in charge of a
watchman.

In carrying on this work I was ably assisted by my fore-
men Messrs. L. C. Wood and W. H. Curtis who had by their en-
ergy pushed ahead regardless of the inclement weather. All
hands were either paid by the month or by the hour, and were
subsisted at their own expense by a boarding master to
whom they all paid 50 cents per day. Tents were provided
for quarters for the men and for the accommodation of the
kitchen and mess.

On this work was paid the following wages:

Two (2) foremen at \$90.00 and \$60.00 per month; boatman
\$25.00 per month; carpenter and blacksmith 25¢ an hour each;
15 to 25 laborers at 20¢ per hour.

The amount of money expended by me on the work up to the end of February has been the following:

	Pay-roll for August 1880.....	\$90.00	
251	Pay-roll for September 1880	\$162.50	
	“ “ “ October “	320.00	
	“ “ “ November “	359.31	
	“ “ “ December “	993.32	
	“ “ “ January 1881	624.15	
	“ “ “ February “	492.48	\$3041.76

Material purchased and used in construction of outfit—

Lumber	\$407.16	
Hardware	131.19	
Paint Oil etc.	20.30	
Miscellaneous	25.95	584.60
	Total	<u>\$3626.36</u>

The cost of the boats built at Wichita, was:

Lumber	218.56	
Hardware	42.80	
Paint oil etc.	5.00	
Hired labor	325.42	\$591.76

The cost of boat built at Arkansas City, was:

Lumber	\$186.63	
Hardware	90.39	
Paint oil etc.	15.30	
Hired labor	423.15	715.47

Total expended in field construction of outfit..... \$1307.25

The following shows the amount and class of work done

Snags

Cotton wood	255
Elm	72
Willow	18
Not classified	11
Total	356

Average, Diameter 11.75 inches Total volume 4287 feet.

Average, Length 16 feet. Total weight—

Average, Volume 12.04 feet.

Overhanging Trees

Cotton wood	74
Elm	30
Willow	49
Ash	6
Total	159

252 Average Diameter 10.47 inches

Average Height 29 feet.

Stumps

Cottonwood	36
Elm	7
Total	43

Average Diameter 21.25 inches.

Rock

Number of pieces 234

Average size 3.1 cubic feet.

Entire amount 27 cubic yards

Very respectfully yours,

J. H. CURTIS,

Assistant Engineer.

To:

Capt. Thomas H. Handbury,
Corps of Engineers, U. S. A.
Little Rock, Ark.,

253 Government here offered, as exhibit 17-A, x the note on page 435 of Volume two of the Expeditions of Pike, heretofore referred to, reading:

A note I penciled June 3d 1864 run thus: "Our route since leaving Larned has been mostly along the north bank of the Arkansas. Queer river that—a great ditch, chock full of grassy islets, stretching through the treeless prairie like a spotted snake, some seasons so dry you can't wet your foot in it for miles, and have to dig for a drink, sometimes a raging flood 200 yards wide."

Government here offered as exhibit 28, the following on page IV and page 1508 of the Annual Report of the Chief of Engineers for 1881, upon the Arkansas River, to which annual report is attached the report of district Officer at Little Rock, reading:

"3. Arkansas River, between Fort Smith, Arkansas and Wichita, Kansas (in charge of Maj. Charles R. Suter, Corps of Engineers To February 1st, 1918). The object of this improvement is to remove snags, rocks and other obstructions to navigation from the Arkansas River, throughout an estimated distance of 358 miles.

During last season some work was done upon the reach between Wichita and Arkansas City, Kan. a distance of about 50 miles and preparations were made for providing the work with some suitable appliance for carrying it on during the coming season. A strong light draught scow built steamboat, provided with a stane and other appliance for removing snags, rocks, etc. is now being built for this service and nearly completed. It is proposed, during the coming season to continue the work of removing these obstructions to navigation as long as the funds available will suffice. It is thought that this will be for about eight months' work.

The officer in charge calls special attention in his report to the necessity for continuing the survey of the Arkansas River made in 1869 from Fort Gibson, Ind. Ter., to Little Rock, Ark., up to Wichita, Kans. He renews the recommendation made by his predecessor in charge of this work, that \$16,300 be appropriated for this purpose."

"Improvement of the Arkansas River between Fort Smith, Arkansas and Wichita, Kansas.

The charge of this work was transferred to me on the 1st of February last by Maj. C. R. Suter, Corps of Engineers.

At the time active field operations were in progress on that part of the river lying between Wichita and Arkansas and Arkansas City, Kans.

Soon after this date, however, on account of high-water and unfavorable weather, these operations were suspended.

From the experience gained in this short season of active operations, it become apparent that for successful and economical work over the 300 miles of river below, extending to Fort Smith, more suitable appliances than we were working with would have to be provided.

254 A large number of snags, some rocks and are to be removed.

Upon my representation of this necessity to you, I was authorized to construct a strongly built, decked scow boat drawing about 12 or 14 inches of water, supply it with suitable propelling power, and appliances for removing these obstructions.

The construction of this boat was commenced at Little Rock, Ark., early in May, and it was expected to have it ready to take the field about the middle of July. Owing, however, to a delay in the construction of the machinery, caused by labor difficulties, it will not be finished probably until a month later. At the end of the fiscal year the hull was ready to be launched, in a completed state, the cabin lumber all gotten out ready to be put together, and the machinery in a satisfactory state of advancement, considering the labor difficulty above alluded to.

It is proposed that this boat shall be finished with all possible dispatch, and at once sent to Arkansas City, Kans.

On her way up the river she will remove only such obstructions as interfere with her own passage, it being presumed

that any boat wishing to go up this season can follow after her.

Upon her return down, however, the obstructions will be more carefully removed. The boat will be kept in the field as long as the funds available will admit, the idea to open a passage by water as speedily as possible to a ready market for the surplus products of the country bordering upon this reach of the Arkansas River.

In order to carry on the work of this character that is needed, an appropriation of at least \$30,000 will be necessary for the year ending June 30, 1883.

This improvement, it will be seen, only contemplates giving temporary and immediate relief to the commerce of this portion of the river.

As this country becomes more and more settled, and its rich mineral and agricultural resources become developed, the want of its commerce will demand that the river be made navigable for a greater number of months throughout the year, and that the works of improvement be of a more permanent and consequently more costly character.

In order that this subject may receive the attention and study that its importance demands, it will be necessary that a reliable survey of the river be made, extending from Fort Gibson, or the mouth of the Grand River, Indian Territory, to Wichita, Kans., connecting with and forming a continuation of the survey from Fort Gibson to Little Rock, Ark., made under the direction of Col. J. N. Macomb in 1869.

Such a survey has been recommended by my predecessor in charge of this work in his annual reports for the last two or three years. In his recommendation and estimate of \$16,300 for this survey, I fully concur, and suggest that the attention of Congress be called for the propriety of making an appropriation of this account for this purpose.

For statistical information bearing upon this improvement, I would respectfully refer to the subjoined copy of a letter kindly furnished me by the Hon. W. M. Fishback, member

of the Arkansas State Senate, residing in Fort Smith Ark.

255 Commercial Statistics. Fort Smith, August 3, 1881.

Dear Sir: Yours of the 1st instant to Col. L. H. Roots, referred to B. Ben & Co., and by him referred to me for reply, just at hand.

In the absence of any accurate statistics, I can only give estimate from conversation with our business men.

There are shipped from this place, by boat or rail, cattle sheep, hogs, cotton, peltries, wheat, hard lumber, pecan, ginseng, snake, root, Seneca-root &c. Of cotton we ship by rail this year, up to date about 24,000 bales, about 4000 of which come from the Indian Territory.

If the increased shipment continues from the later for the next five years at the same rate as for the past two years they will ship 25,000 bales themselves. This is exclusive of what goes by other means and other routes than by Little Rock and Fort Smith Railroad. We ship annually about 1,000,000 pounds of hides and petries, five-eighths per cent of which comes from the Indian Territory, or shipped from there. We have bought from the Indian Territory or shipped from there, about 5,000,000 feet of hard lumber (walnut, ash and oak) cattle, hogs, and sheep are, for the most part, driven on foot and in immense numbers.

There are handled in this city at least 1,250,000 sacks of flour every year, all of which would come from Kansas, either in flour or in grain, if we had cheap transportation thence. The other articles are in less important quantities.

Now if we had river communication with Kansas, my own experience justifies me in saying that if we had cheap transportation between here and Southwest Kansas, we would find it to our advantage to purchase all the wheat and flour and beef from that region where they can be produced with so much less cost and give our attention to that species of produce which we can furnish at so much less cost than they.

We have unlimited quantities of coal and lumber, and are remarkably well adapted to cotton and sheep raising, but are not adapted to wheat or extensive grazing. This interchange of productions would increase with indefinite rapidity and seems to demand early and cheap means of intertransportation.

The country along the bank of the Arkansas River from Fort Smith to Kansas is settling rapidly, and if they had sure means of transportation, there is no estimating the increase of trade. The country is of unsurpassed fertility, but as yet a comparative wilderness. There is no place in the United States, in my judgment, where the United States could put in a million dollars with more profit alike to the nation and to the immediate vicinity.

Very truly,

W. M. FISHBACK.

Capt. Thos. H. Handbury.

Government here offered as exhibit 29 letter written by Joseph Evins, to Capt. Thos. Handbury, reading:

256

(Plaintiff's Exhibit 29.)

United States Snag Boat "Wichita"

Arkansas River

F. 926. 2

Records Chute Sept. 29, 1881.

Capt. Thos Handbury

Corps of Engineers U. S. A.

Little Rock

Dear Sir

Since writing you this morning one of the cogs in the Large Pinions on the Short Spindle broke out which renders the double purchase worthless till repaired. I hardly know what to do but I think I can repair and do any light work and go on to Fort Smith by the time we arrive there Sweeney can have a new Set of wheels there can Put them in the oughtoto send a double sett for if there is the least flaw they are likely to give way at any time we only had 1½ line out when it give way. So the Strain could not have been great. I sent this by Special Messenger and will work here and get some wood till I hear from you. We are only drawing 15 inches with all on board don't think we will have any trouble getting up. I am Sorry to have to make this report. Boat and outfit can't be beat good Crew. Our Pilot is delighted with her work. If you telegraph Sweeney say one broken large wheel on Short

Spindle, send an extra Sett all round he has the Sizes and Patterns and to be able to duplicate them very quick.

Respectfully your

Obt Svt

JOSEPH EVINS,
Capt. U. S. Snag Boat Wichita

257 The Government here introduced in evidence the following certified copies of letters written by Joseph Evins to Capt. Thomas H. Handbury, Little Rock, Arkansas, on the following dates, addresses and signatures omitted:

(Plaintiff's Exhibit 30.)

October 9th, 1881.

We are now 20 miles below Fort Gibson. All well and Boat in good order. Sweeneys Agent competed the capstans this morning. I landed made fast to tree and parted a heavy line with it twice, forward and back. It now reverses, runs as well one way as the other. The capstan is good but does not pull as strong as it ought to though it will stand as much as any of our lines. It would be twice as strong if the large wheels were increased in size and the small ones diminished but the motion would be slower but it will do well as it is. Myself or any one else who has charge of this boat should make no excuses for not doing good work for I do not believe there could be a better little boat built than we have for lowwater work. We make an abundance of steam without shaking or poking with the doors open half the time, burn less wood than any boat I ever was on of the same capacity. My intention is to rush through to Arkansas City on the present water. From the present prospects I think we will reach that point by the 17th without further instructions I will remain in the neighborhood of that city a few days and then return to Fort Smith and work back again. There is entirely too much water to do affective work at present but it will assist me greatly to run over the field of our future labors. Thus far I have found a beautiful river very few snags in sight at present stage of river. Above Fort Smith I find nearly all bars covered with graved appears to be hard; very few cutting. It has been raining nearly all day with fair prospects of another rise. I failed to get up log book at Fort Smith hope it will be there on my return also the Rock Hooks. I know we will need both. I know of no Post Office convenient to the river between Fort

Gibson and Arkansas City so you will please direct your communications to the latter place till you hear from me again.

(Plaintiff's Exhibit 30-A.)

258

October 15, 1881.

Enclosed find Log for Week ending today in addition I have but little to say. I find the further we move up the more difficulties we encounter. Some places the river bed is nearly a mile wide out in small channels leaving little islands and bars scattered over the river. We find but few snags about one-fourth as many as there is in the river below Fort Smith what we do find are easily removed. We get all the ash wood we need on the banks. The health of the crew is good. We killed fine deer in the river yesterday. Cannot say when we will get to Arks City but will get there as soon as possible. The indications are good for rain this (Sunday) morning. We are making such poor headway I shall run every Sunday till we get to Arks City. This is decidedly the finest country I ever saw but few people living along the banks. Cattle in fine condition since the fall rains set in the grass has sprang up and looks like spring. Been no frost here everything green. Will telegraph you on my arrival at Arks City. With my regards.

(Plaintiff's Exhibit 30-B.)

October 20th, 1881.

Since writing you from Fort Gibson we have made slow progress. The river has continued to fall till there is very little left. We worked 6 hours yesterday pulling up on 10 inches water and then had to pull back into deep water it being dangerous to have the boat on ground at night, for fear of a change in the channel. I shall not attempt to move up further until we have more water. Am chopping wood and leaving it on the bank. I sounded up the river 2 miles today found 5 shoal reefs with less than a foot water. If there were but one every 10 or 20 miles we could afford to work over them, but at present stage of the river we find them every few hundred yards. So it would be folly to wear out rigging for the distance we made. It has been raining above and I hope to see a rise in a few days. We are near Wealake P. O. Creek Nation. I hope we will not be here long enough to receive an answer to this letter but if you wish to write you might direct here. I shall instruct the P. M. to forward our mail to Arkansas City, Kan., after we leave. We find very few snags in

the way. Have taken out a few and some rack heaps. The
259 trouble is the sand reefs. The bed of the river is generally from $\frac{1}{2}$ to $\frac{3}{4}$ miles wide. Often with water from bank to bank. The reefs frequently extend entirely across and lay in waves. Sometimes not more than 100 yards apart. The boat is in splendid condition. All well on board.

(Plaintiff's Exhibit 30-C.)

November 6th, 1881.

Yours of the 13th October 1881, received. Your instructions in regard to work in the neighborhood of Arkansas City have been carefully noted. I think I understand your wishes perfectly and will use my utmost ability to carry them out. Well we are still detained here for want of water (see Log No. 5). Our messenger arrived from Ark. City last night bringing us the first mail since we left Fort Smith. We are about 140 miles below Arkansas City by water and about 30 miles below Pawnee Agency the nearest post office.

If we don't get away with the boat this week I will go up to Arkansas City after our registered mail matter. If I was in the State I should certainly discharge crew and stop expense, but I hardly think it would do here. It would require a guard of 6 to 8 to keep this thieving Indians off and we may have water any day and could not replace our crew without your orders and without sending out of the Indian Country, so I shall make no change without your orders, for the present unless it be to reduce the cabin crew 2 men and deck crew 4 men. We are chopping wood. Have about 60 cords at this place and some below. Three days run will let us up to Arkansas City and I hope we will soon have water to make it.

(Plaintiff's Exhibit 30-D.)

October 31st, 1881.

We are still at the bank waiting for water doing but little the engineer is polishing and painting the machinery the carpenter is building lockers and doing other necessary work the mate has the deck hands and firemen cutting wood. We are adding several conveniences in the way of civies ring-bolts and so forth also nice cedar spars. Game is very plentiful in 2 or 3 hours the other day 2 of us killed 8 fine turkeys. We killed since we stopped here 16 turkeys and one deer besides all the squirrels we want. The river is very low not

more than 8 inches good water. Since we past the Cimarron
the river is not so wide and less rain would give us
260 water here than would be required below. There is
no work that we can do on the river at this point. Hope
we will get away soon.

(Plaintiff's Exhibit 30-E.)

November 20th, 1881.

After writing you last Sunday the river commenced rising and on Tuesday, Wednesday and Thursday rose about 2 ½ feet. We have moved up on this rise about 60 miles. You can hardly imagine the difficulties we meet with. The sand is continually moving, shifting and making reefs. For example on the present rise of not less than 2 ½ feet there was at no time that depth of water over the sand reefs, notwithstanding there were not less than a foot before the rise. We only found on the shoalest crossings today 13 inches. If we don't find better water tomorrow I shall go up to Arkansas City and bring down the largest one of the boats I spoke of in my last letter.

In reporting the rise and fall of the river in Log Book 1 would state that it is only taken at night except when we are laying up during the day. We have had no trouble with the machinery or capstan. Boat not scratched. The wire tiller rope parted to-day; had it spliced as good as new. There must have been some defect in it as the strain was less 1/3 what it ought to have stood. I have not received anything from you since your letter of the 13th of October. I suppose I will get some mail at Arkansas City. If we have to stop tomorrow for low water, which is quite likely, I shall go up myself and bring down flat and write you from Arkansas City.

(Plaintiff's Exhibit 30-F.)

November 13th, 1881.

Another week has come and gone and but little progress made in our operations. We had a rain fall of 1-½ inches Friday and Saturday. River rose one foot and commenced falling Saturday noon and has fallen up to this time (Sunday noon) 8 inches. We moved up about two miles by hauling over 2 crossings with lines and sparring. From the quantity of rain I expected a rise of 6 or 8 feet. We were laid up at the base of a hill and the water ran off in torrents but I soon found

that but little water ran into the river elsewhere the sandy prairies lying along the banks seem to take up the water as fast as it falls. The river bed at this point is solid rock and water not more than 13 inches in depth. The river is about as wide here as it is at Little Rock with a great number of islands towheads and flat sand bars. I counted 261 from the pilot house 32 naked spots and found 2 to 5 chutes different streams of water at every point. Very few snags in the river from Fort Gibson to this point. With 30 inches water I believe I could clear them all out in 90 days. I am informed there is more from here up. There is one place below that the hanging timber below will have to be cut and taken out for about 1- $\frac{1}{4}$ miles and I am told there is several places above similar. If we don't get away by Tuesday I shall take 6 men and go to Arkansas City and bring down the largest one of the flats and light up be removing wood, stores and in fact everything portable on board the flat. By that means I can light up the steam boat to 13 inches and try to haul her up. I don't want to be caught in this place in a freeze up, however, I hope for a mild open winter and hope we will soon be able to report to you from Arks. City, Kans.

The boat is in perfect order, I am well pleased with our engineer. He taken a pride in keeping everything in good order, in fact I am well pleased with my entire crew and I am sorry that we cannot go ahead with the work. With my regards.

(Plaintiff's Exhibit 30-G.)

November 24th, 1881.

I arrived here last night found one boat that will answer very well for a lighter for the Wichita the other boats and most of the property is no good. Under the instructions you give me I will take on board everything that will be of any use and dispose of the balance to the best advantage and make detailed report. I want to return to Wichita tomorrow so I will not be able to close the matter up till I get up with the boat. I will start the barge down in the morning. The ice is running heavy this evening but it is moderating again. From the best information I can get here we are about 130 miles by water below Arks. City.

(Plaintiff's Exhibit 30-H.)

December 1st, 1881.

Enclosed find subsistence report for the month of November 1881. The reduced cost of rations this month is attributable

to using wild game and economical cooks. We have plenty of rations for nearly three months longer except a few articles that I will send in requisition for as soon as I see any chance of doing anything. Except the barge down today. Shall make an effort to go on up by lighting up on barge and if I can find 11 or 12 inches water I will haul up, but the river is very low and I doubt finding it. The weather is warm for the season and we may have water soon. I will put the Wichita at Arkansas City if possible I will write you more fully Sunday.

(Plaintiff's Exhibit 30-J.)

December 4th, 1881.

I have been troubled every since I passed the bridge near Fort Gibson. The very thing that I have been trying to avoid (that was following in the footsteps of Mr. Curtis) seems likely to occur. To say that I am sorry that our progress has been so slow and barren of results does not half express my feelings. When I accepted this work I had three motives in view. One was that I felt a deep interest in the improvements of navigation on the Arkansas where I expect to remain the remainder of my life; another was that having had almost a lifetime practical experience on the river I hoped to succeed in a manner to secure your approbation and make a reputation for myself as a competent man for such work. The other was that I might secure a permanent employment at reasonable good salary to support my family. After having received every courtesy from you that could be expected or desired and all the encouragement asked for it makes me feel despondent at the results thus far. I have always made it a point to never engage in anything that I did not understand and if I fail in this for want of foresight or energy on my part it will be the first. If I had known all the difficulties attending this work before I entered it I should not have encouraged the commencement of operations at this season of the year. Low water is not what is needed here for work. I am satisfied with what I have seen that the river seldom if ever gets too high here for active operations in removing overhanging timber and what few snags there are in the river. There are very few loose rocks in the river; none in the way up to this point. There is a riffle about four miles below Arkansas City that will require the removal of considerable quantity of small rocks. If we were at Arkansas City we could do about one months work, making good show in any stage of the river. Then to make the improvement worth anything to navigation,

a system of brush dikes almost continuous will have to be put in. There is undoubtedly a sufficiency of water, if it
263 could be confined to a [a] narrow channel for navigable purposes for light boats six to nine month in year. This character of work could be constructed best when the leaves are on the brush and water warm so men could work in the water. Our barge came down yesterday all safe. Had no trouble only drew three inches. Before it arrived the river had fallen so low (only 8 inches) that we cannot move till we have another rise. I have paid off the watchman and 5 other men. Have still on board in all 17 men. We are spending too much money doing nothing and as we are likely to have some ice and such weather as will stop work soon, if we were up, I would recommend that we at once pay off all except enough to watch the boat till spring opens. Let the watchmen subsist themselves from the shore. Our supplies and rations are not perishable and can be locked up and kept good till March or such time as you ordered work resumed. If we were there now the wather being cold we would work under great disadvantages. In case this arrangement meets your approval I can take care of the boat and take her up with myself or some other pilot, one engineer, one watchman, one fireman, one cook, one deckhand, in all six men. When we arrive at Arkansas City only keep two men day and night watch till work is commenced. Now I would prefer to work if I were consulting my own interest but I make this recommendation feeling that it is due you and to the interest of the Government. I feel the work ought to be prosecuted for the Government with the same economy as if for a private individual. Have you ever examined McGowns survey and tracing. From my observations of the river it is a very correct tracing of the river we have passed over. It has mostly been made on about the same stage of water we have seen on our trip. I find it shows 903 islands and marked bars between H. K. & T. R. R. bridge and the bridge at Arkansas City surrounded by water. By examining it closely you will see at once that the only hope to permanently improve this portion of the Arkansas is to build dykes and if you continue me on the work I would be glad to report in person with the tracing and agree definitely upon the plan which you wish adapted. This system and style of work could be done as cheaply here as anywhere. Brush and stone seem to be plentiful along the shores. As the mail seems to be slow getting to this remote,
part of God's country perhaps it would be better to
264 telegraph me if you wish my suggestions carried out as it would save several days wages of the crew. The

mail leaves Arkansas City Monday and Thursdays for Pawnee Agency, our nearest post office. I have arranged with the post office Master at Arkansas City to forward our mail except registered matter, also with the telegraph operator to forward by mail any dispatches for me. The people of Kansas are earnest in the matter of opening the Arkansas through to the Mississippi River. They say they must have timber and coal from the State of Arkansas.

Gov. St. John of Kansas with a party of friends will be here tomorrow to see the boat. With my regards,

(Plaintiff's Exhibit 30-K.)

December 16th, 1881.

Yours of the 9th informing me of the return of pay rolls for November 1881 received. Will give the matter immediate attention. I leave for Arkansas City to-day. The river continues to fall. Not enough to float a skiff on. You speak of returning to Fort Smith. The fact is we could go up easier than we could return. We are above all the principal tributaries. The weather is still pleasant and warm for the season. We may yet have rain and water. Arkansas City has splendid harbor in Walnut Creek in case of ice. Enclosed find Log Weather report for last week. Your reference to my letter of the 13th November I think I understand.

(Plaintiff's Exhibit 30-L.)

December 23, 1881.

Your letter of the 12th just received. Your orders will be strictly complied with. I start to Arkansas City to-day where I expect to meet funds to pay off. The crew I leave in charge of the boat I will pay to 1st January 1882. Will bring with me reports for December and quarterly property return. I will have to return to the boat from Arks. City so I will not be able to reach Little Rock before the 5th or 6th of January. The weather is warm and pleasant almost like spring today but still we have no rain. A boat drawing 8 inches water could not move a $\frac{1}{2}$ mile from where we are.

(Plaintiff's Exhibit 30-M.)

January 31st, 1882.

I arrived at the boat yesterday found everything about
265 the same as when I left. River still low. About 3
inches of snow fell here yesterday. The weather is mod-
erating and prospects rather favorable for us to get out soon.
Of one thing you may rest assured I will come down with the
boat as soon as it is possible to do so. All well on board.
Killed one deer and 2 turkeys to-day.

(Plaintiff's Exhibit 30-N.)

February 11th, 1882.

Another week has passed and gone with but little change
here. The river has risen about 4 inches in the last 4 days. I
am having the property all brought down from Arkansas City
and expecting it today. Have fuel on board and ready to
leave as soon as the water will permit. We have had but one
light snow here. The weather has been remarkably warm for
the season.

(Plaintiff's Exhibit 30-O.)

February 21, 1882.

We are still here. In the last 24 hours we have had light
rain and freeze. About one inch of ice on the ground. If it
goes off with rain it will give us water. The flat boat with the
balance Mr. Curtis outfit got here yesterday, out 14 days,
found about 8 inches water. There are several items short by
the list. I have sent back to see if something more could not
be found. Will report as soon as I can ascertain. As soon as
the weather moderates a little I shall start down, water or not
water. It will only add a little wood to our expenses and I
want to see how the sand moves.

(Plaintiffs' Exhibit 30-P.)

February 28th, 1882.

We left yesterday at 10 o'clock A. M. Worked all day
sparing, moved down about $\frac{1}{4}$ mile. To-day we are doing
better, but it is slow business taking a boat drawing 15 inches
water over 12 inches. The river is rising a little to day and I
hope our delay and troubles at this point will soon end. I

shall continue to work if I don't make a mile a day. I know how to handle a steam boat and use rigging and will see that everything is well cared for. Our crew today consists of 10 men all told, enough to go down with if we can go at all. I can get all the men I want at Fort Smith. Continue to send mail to Pawnee Agency or Arkansas City until you hear from us at Fort Gibson. When we get out of reach of Pawnee Agency or Arkansas City I will leave instructions with the Post Masters where to forward our mail. I expect you will object to the ink I am using, it is rather pale. While I was away it froze and I cannot get any better here. It copies very well yet. Our cook has been quite sick for two days. As we had only the one cook aboard we miss him. He is better to day and things he will be able to go to work tomorrow. Will report progress again before we get out of reach of Pawnee Agency.

(Plaintiff's Exhibit 30-Q.)

March 14, 1882.

We are now 14 miles above the mouth of the "Cimarron". Have been 16 days coming about 45 miles. We only had one foot rise. Just enough to sweep over the little narrow channels and fill them up. The river has been falling about 2 inches every 24 hours for 3 days. If it continues 2 days longer we will be compelled to go to the bank and wait for water. This is a strange country. It rained and snowed 3 days last week but did not seem to affect the river. Am only working 6 men. Will do all I can to get out as soon as possible.

(Plaintiff's Exhibit 30-R.)

March 18, 1882.

The river has risen about one foot. We are getting along better now. I think we will be at Fort Gibson with the boat by the 25th. Will telegraph you from that place. Have received no mail for 3 weeks. Sent back to Pawnee Agency but the Postmaster had forwarded our mail to Fort Smith Arks. except your official letter which he returned to your office. Please forward all to Fort Smith till further notice. Will not send up the river again for a while. We lose about $\frac{1}{4}$ of our time on account of wind. All well on board.

(Plaintiff's Exhibit 30-S.)

March 31, 1882.

Enclosed please find a copy of log for four weeks; have had no opportunity to forward it before. It will show what we have done. I sounded the river thoroughly yesterday to the mouth of the Cimarron. I only found about 7 inches of water on the reefs and you find these sand reefs 200 to 300 yards apart. There is very little water discharging from the Cimarron; the whole river to-day could be discharged through an opening 4 feet square. Judging from the marks on the timber the rise and fall of the river at this point is about 12 feet. This continued low water is extraordinary and cannot continue much longer.

267

(Plaintiff's Exhibit 30-T.)

April 15, 1882.

Just arrived eighty miles overland by wagon. Have not been able to move the "Wichita" since writing you on the first. Have had no rain to effect the river. About 6 inches in the Arkansas and scarcely any in the Cimarron. Found no mail at Fort Gibson. The postmaster at Fort Smith did not forward registered mail so I had to telegraph from here and wait till Tuesday evening. I find Verdigris and Grand River both high, which gives 5 to 6 feet in main Arkansas River from mouth Grand River to Fort Smith. I shall return to the boat on Wednesday morning. There will be no time lost getting down when it is possible to run, night or day.

(Plaintiff's Exhibit 30-U.)

April 20, 1882.

Arrived from Muskogee today. Found the boat in good shape. During my absence the river rose about 8 inches and fell back 5; could not have moved if I had been here. The river is now at a stand and I think will be rising by morning. It is now late enough to get water from the head of the river and we may have it here any day without rain. I feel now that I ought to have reduced the crew to a guard and night watch months ago but the winter was so mild I expected to get out long since. Now we ought to be ready and take every advantage of a swell if not we might be caught here for another season. I only have 11 all told on board; as light a crew

as the boat can be worked with safety. I will not let any chance escape me and come at the earliest possible moment.

(Plaintiff's Exhibit 30-V.)

May 9, 1882.

Out in good order will be at Fort Smith to-morrow.

(Plaintiff's Exhibit 30-W.)

April 30th, 1882.

Since writing you on the 20th I have sounded the river five miles below. Found about 8 inches water. We had a little swell here on the 28 and 29 about 3½ inches but it fell again last night about 1 inch. We have had steam up every since the river commenced swelling but the fall last night destroys all hope for the present. If it would be more satisfactory to you please send some competent man here to inspect and report the condition of affairs. You can tax me with the expense. Reports for April will be forwarded tomorrow.

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(Plaintiff's Exhibit 30-X.)

May 10th, 1882.

I have the honor to report our safe arrival at this port. We made the run from Fort Gibson in 9 hours. The rain fall where we were on the 2nd, 3rd, 4th, 5th, 6th and 7th amounted over 5 inches. The country above is flooded from the mouth of Cimarron to mouth of Grand River. The river is on a stand here this evening; little too high for effective snagging, but the ~~time~~ can be put in cutting over hanging timber and deadening trees along the shore. If you could give me your plan for repairing the dyke at this point it would be good time to prepare the material while the river is too high for other work. The mail is 5 hours late so I could not see your instructions before the mail left for Little Rock. Can ship all the men I want at 30 per month.

269 Government here offered in evidence two letters from Captain Handbury to Joseph Evins, commanding the U. S. Snag Boat "Wichita", dated December 10th and 12th,

1881, respectively, as exhibits 31 and 32, and reading as follows, omitting the address and signature:

(Plaintiff's Exhibit 31.)

Sir:

I am watching your progress up the river with a great deal of interest and commend the tenacity with which you stick to the main object. The weather and the water certainly has been surprising. For the last month we have had abundance of water for all purposes below Fort Smith. It is remarkable that you have had so little where you are. I still hope that you will be able to pull through and get back again to Fort Smith before you get frozen in. If you find that you cannot get up to Arkansas City after lightening your boat you are authorized to turn back, and if this cannot be done to lay her up for the winter.

I received your November pay rolls yesterday but on account of a very essential formality that is wanting in them have been obliged to direct that they be returned to you for amendment. As soon as they are returned I will send you my check for the amount yet due on them. It seems like putting you to a great inconvenience and the government to additional expense for a very slight informality but the law makes it so. I cannot draw my check for so large an amount without having vouchers signed in due form in my possession to cover it. I could not retain these rolls, send you the money and have you witness the signatures on your arrival here, as that time is an uncertainty. The rolls must accompany my accounts to the Chief of Engineers which are to be rendered at the end of this present quarter, Dec. 31.

270 Referring to your letter of Nov. 1 asking for instructions as to how your bills for transportation of certain of your men are to be paid and also messenger with mail I have to say that in such cases as this the easiest way over the difficulty is to have the person furnishing the transportation, as for instance the man from whom you hired the wagon, to sign duplicate vouchers for the expenses of the trip; send them with an itemized memorandum to this office where the vouchers will be made up in the proper form. Your messenger if not on your rolls can be paid on an ordinary voucher, if he is upon your rolls he must sign a set (a) of the travel vouchers that were furnished you. Regarding the memorandum of expenses an itemized bill, per 11, Sec IV of your book of instructions will cover cases such as these.

The expenses of your own journey from your boat to Arkansas City will be paid upon presentation of your memorandum and signed travel vouchers.

Your steady perseverance in your effort to get to Arkansas City I hope will meet with the success that it deserves.

Yours, etc.,

XXXXXXXXXX

XXXXXXXXXX

(Plaintiff's Exhibit 32.)

Sir:

Yours of the 4th instant came to hand yesterday and I hasten to reply to relief you of any anxiety that you may feel in regard to my wishes as to your course of action. Your anxiety for instructions has been anticipated in a letter that I mailed to you on Saturday last. These instructions are simply that if you could not get either up or down to lay up your boat where you are. The details for doing this are, of course, left to you.

I should think however that it would be good policy to leave on the boat an engineer and some one who could bring her down to Fort Smith in case we should have one of
271 those sudden unexpected rises that sometimes occur.

With these as a nucleus they could make shift for the balance of the crew.

That you did not succeed in getting through to your destination need not trouble you in the least. You certainly have done everything that it was possible for you to do to carry out your instructions and no one could ask of you more. Your efforts are worth to the government what they have cost in the knowledge that we have gained of that portion of the Arkansas River, and in demonstrating the fact that it cannot be profitably navigated by steamboats until some radical system of improvement looking to concentration of the water that is in its bed, has been adopted and carried out. Before we can enter upon this as you suggest in your letter a thorough and systematic study of the whole reach of the river will have to be made, plans will have to be devised and estimates made and submitted to the Chief of Engineers for his approval. Before this can be done a thorough instrumental survey will have to be made. Estimates for this purpose have already been submitted and I am in hopes that

Congress will, during the present session, make the necessary appropriation.

The funds yet remaining from the appropriation of last session for the improvement of the Arkansas River between Fort Smith and Wichita can very profitably be expended by using your boat below Fort Gibson after the river opens next spring. The part of the river that you are now in will receive further attention in due course of time.

After you have laid up your boat and left her in charge of some competent person you can report in person at this office.

Yours, etc.

272 Government here offered as Exhibit 33 certified copy of Log Book, of United States Snag-Boat, Wichita, kept by Capt. Evins, reading:

U. S. Snagboat Wichita.

Log Book.

for the week ending Saturday October 1st, 1881.

Wednesday, September 28, 1881.

Left Little Rock, Arkansas, for fields operations. Moved up to the mouth Little Maumelle and took on 3 cords wood and proceeded up the river. Stopped at foot Rectors Chute and pulled 3 snags and lay up for the night at 7 o'clock P. M. distance traveled 12 miles. Thermometer at 6 A. M. 70 at 12. M. 90 at 6 P. M. 80. River stationary.

Thursday, September 29, 1881.

Worked all day in Rectors Chute. Pulled 12 snags and stumps, besides other snags, logs and stumps less than a foot diameter which we keep no record of.

Steamers Roseville and Mill Boy passed up and steamer M. T. Powell down. The Powell lay on the bar near us about six hours. We gave them half hours assistance. Broke cog on double purchase Capstan. We are now only working single purchase. Moved up 1 mile near head of Rectors Chute. River stationary. Weather warm and raining since 4 o'clock P. M., Thermometer at 6 A. M. 75 at 12. M. 88, 6 P. M. 80.

Friday, September 30, 1881.

Cleaned out boilers and cleaned up boat. Repaired double purchase Capstan. Raised steam and took out 1 snag. Dropped down one mile to wood landing and took on $4\frac{1}{2}$ cords wood. Weather warm and cloudy. River rose 3 inches. Thermometer at 6 A. M. 75 at 12 M. 86 at 6 P. M. 83.

Saturday, October 1, 1881.

Moved up one mile in Recotrs Chute and taken out 3 snags one very large cypress stump. Left Rectors Chute at 10 A. M. stopped at Barretts Chute and taken out 5 snags. Lay up for the night at Stells landing. Distance run 35 miles. River rose 4 inches. Weather cloudy. Thermometer at 6 A. M. 70, at 12 M. 81, at 6 P. M. 80. I certify that the above and foregoing is a correct copy from the Log Book for the part of the week ending Saturday October 1, 1881.

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Log Book.

For week ending October 8, 1881.

Sunday, October 2, 1881.

Left Stells at 7 A. M. taken on $4\frac{1}{2}$ cords wood at mouth Cadron. Thence to Dardanelle; arriving there at 9 P. M. distance run 65 miles. River rose 3 feet. Weather cloudy, thermometer at 6 A. M. 77, at 12 M. 89 at 6 P. M. 87.

Monday, October 3, 1881.

Cleaned out boilers and paid off. Left for about 5 P. M. Arrived at mouth Illinois Bayou at 7 P. M. and lay up for the night. River rose 4 feet. Very muddy and considerable drift running. Thermometer at 6 A. M. 71 at 12 M. 96 at 6 P. M. 84.

Tuesday October 4, 1881.

Left mouth Illinois Bayou at 6 A. M. River rose 21 inches last night. Taken on $6\frac{1}{2}$ cords wood at Buffstetters landing. Moved up to Roseville distance 50 miles and lay up for the night.

River falling. Thermometer at 6 A. M. 73 at 12 M. 86 at 6 P. M. 89.

Wednesday, October 6, 1881.

Left Roseville at $6\frac{1}{2}$ A. M. Taken on 7 cords wood at Byers landing, also $6\frac{1}{2}$ cords wood at Myers Landing. Arrived at Van Buren at 11 P. M. River rising fast. Heavy current and

drift. Lay up for the night. Thermometer at 6 A. M. 72, at 12 M. 76 at 6 P. M. 77.

Thursday, October 6, 1881.

Left Van Buren at 7 A. M. Arrived at Fort Smith at 9½ A. M. Cleaned out boilers. Waiting for Capstan machinery, river rose in all 10½ feet. Commenced falling slow this evening. Thermometer at 6 A. M. 60, at 12 M. 80 at 6 P. M. 78.

Friday, October, 7, 1881.

Lay over all day at Fort Smith waiting for Capstan machinery River fell 3 feet. Thermometer at 6 A. M. 68, at 12 M. 79 at 6 P. M. 76.

Saturday, October 8, 1881.

Left Fort Smith at 7 A. M. River falling slow. Taken on 6 cords wood at Huff's Hill. Lay up for the night short distance below Webber Falls. Thermometer at 6 A. M. 70, at 12 M. 87, at 6 P. M. 96.

(Signed) JAMES F. EVINS, Clerk.

Approved. Jos. Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending October 13, 1881.

Sunday, October 9, 1881.

Left mouth Sallisaw at 5 A. M. Taken on 4 cords wood at Brays landing, and 3 cords at Sizemore's landing. Lay up for the night Walker's landing, 15 miles below Fort Gibson. Distance run about 60 miles. Weather cloudy with light showers rain. Thermometer at 6 A. M. 74, at 12. M 77. at 6 PM. 76.

Monday, October 10, 1881.

Left Walker's landing at 5 AM. Stopped at Fort Gibson for mail. Passed Fort Smith at that point. Left Fort Gibson at 12. M. Arrived at M. K. & T. R. R. Bridge at 1 P. M. lowered chimneys and passed under had 5 feet to spare. Found about 4 feet under of water on the bars, above bridge.

River stationary. Lay up for the night about 10 miles above bridge. Thermometer at 6 AM. 72, at 12, M. 70 at 6 PM. 69.

Tuesday, October 11, 1881.

Cleaned out boilers. River rose 18 inches. Left at 6 A.M. Found river wide and shoal. High winds all day. Lost 4 hours for wind. Chopped 3 cords wood. Moved up about 35 miles. Weather cloudy. Thermometer at 6 A.M. 63 at 12 M. 72 at 6 P. M. 79.

Wednesday, October 12, 1881.

Heavy wind all day. Only run about 8 miles. Passed over 18 inches water. Worked 6 hours on one bar. Cut 5 cords wood. River fell 6 inches. Weather warm and cloudy. Thermometer at 6 A. M. 74, at 12. M. 79 at 6 P. M. 81.

Thursday, October 13, 1881.

Left at 6 A. M. River fell 3 inches. Passed over shoal bar only 16 inches. Run up 2 miles on another bar only 13 inches. Worked 3 hours and failed to get over. Dropped in to the bank and chopped wood till night. Weather cloudy with prospects of more water.

Thermometer at 6 A. M. 59, at 12. M. 59 at 6 P. M. 64.

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Friday, October 14, 1881.

River rose 2 inches. Left at 6 A. M. Been on shoal water all day. Had to pull over one sand bar. Run about 10 miles. Met red rise this evening at 5 o'clock. Lay up for the night 6 P. M. Cut one cord wood. Weather warm prospects rain. Thermometer at 6 A. M. 63. at 12 M. 83 6 P. M. 81.

Saturday, October 15, 1881.

Left at 6½ o'clock A. M. Pulled over 2 bars. Lay on one bar 6 hours. Run about 5 miles. Lay up about 4 o'clock P. M. and cut 4 cords ash wood. River fell 2 inches.

Thermometer at 6 A. M. 72, at 12. M. 77, at 6 P. M. 61.

JAMES F. EVINS, Clerk.

Approved. Joseph Evins, Capt.

Log Book.

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U. S. Snagboat Wichita.

For week ending October 22nd, 1881.

Sunday, October 16, 1881.

Cleaned out boilers. Left at 8 o'clock A. M. River fell 3 inches. Only run about 5 miles. Been pulling over sand bars

nearly all day. Thermometer at 6 A. M. 58, at 12 M 75 at 6 P. M. 80.

Monday, October 17, 1881.

Left at 7 o'clock A. M. River fell one inch. Had to haul over 4 bars. One about $\frac{1}{4}$ of a mile wide. Only from 13 to 16 inches. Run about 3 miles and lay up for the night, at Weelake. River on a stand tonight with prospects of better water above. Weather cold and cloudy.

Thermometer at 6 A. M. 71, at 12. M. 78 at 6 P. M. 59, 9 P. M. 55.

Tuesday, October 18, 1881.

River fell one inch. Lay up for wind and chopped wood. Left weelake at 1 o'clock P. M. Hauled over 2 bars moved up 2 miles and lay up for the night. There is less than 15 inches water in the river. People say along the bank that the river in about one foot above extreme lower water mark. Don't think it can get any worse for us. If it don't rise it will cut out.

Weather cool and cloudy. Thermometer at 6 A. M. 49, at 12. M. 54, at 6 P. M. 57.

Wednesday, October 19, 1881.

River rose one inch. Dense fog till 11 o'clock. Worked balance of the day on sand bar and failed to get over. Only 10 inches of water. Hauled back in deep water and lay up for the night. Moved up $\frac{1}{2}$ mile.

Thermometer at 6 A. M. 45, at 12 M. 64, at 6 P. M. 57.

Thursday, October 20, 1881.

Have not moved boat today. River fell one inch. Sounded 2 miles up river found 5 reefs in that distance with 10 to 13 inches. Shall not move till the river rises. Chopping wood and cording it on the bank. Weather clear and pleasant.

Thermometer at 6 A. M. 41; at 12 M. 70; at 6 P. M. 63.

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Friday, October 21, 1881.

Chopped wood all day. River rose one foot. Taking one wood tonight. Will leave at day light in the morning for Arkansas City. Weather mild, prospects of more rain.

Thermometer at 6 A. M. 52; at 12 M. 65; at 6 P. M. 66.

Saturday, October 22, 1881.

Left at 7 o'clock A. M. river rose 2 feet. Moved up about 30 miles. Light rains with prospects of more rain.

Thermometer at 6 A. M. 51; at 12 M. 70; at 6 P. M. 64.

JAMES F. EVINS.
Clerk.

Approved.
Joseph Evins, Capt.

278 Log Book.
U. S. Snagboat Wichita.

For week ending October 29, 1881.

Sunday, October 23, 1881.

Left at 7 o'clock A. M. River fell 3 inches. Run against strong head wind. Made about 50 miles, lost 3 hours, cutting two vords wood. Weather clear and pleasant. Thermometer at 6 AM. 67; at 12. M. 54; at 6 P. M. 58.

Monday, October 24, 1881.

Left at 7 o'clock, river fell one foot, passed mouth Red Fork at 10 o'clock. Found the main Arkansas river not so wide and in better shape but shoal. Had to pull over 2 bars. Lay up for the night at 8 o'clock P. M. Run about 25 miles. Cut one cord wood.

Thermometer at 6 AM. 42; at 12. M. 54; at 6 P. M. 64.

Tuesday, October 25, 1881.

Left at 7 o'clock AM. Aground all day nearly. Hauled over 13 inches water. Chopped 3 cords wood. Moved up about 5 miles. River fell 2 inches and still falling. Lay up for the night at 5 o'clock PM.

Thermometer at 6 AM 47; at 12 M. 67; at 6 P. M. 67.

Wednesday, October 26, 1881.

Left at 7 o'clock AM. Worked on one reef till 12. M. Hauled back and chopped wood balance of the day. Rive too low to proceed further. The river is stationary with prospects of another rise soon. Weather warm and cloudy. Thermometer at 6 AM. 55; at 12. M. 70; at 6 PM 69.

Thursday, October 27, 1881.

River fell one inch. Light rains. Lay up on bank all day and cut nine cords wood. Thermometer at 6 AM. 59; at 12 M. 62; at 6 P. M. 63.

Friday, October 28, 1881.

River fell 3 inches. Still chopping wood and waiting for water. Weather cool and cloudy. Thermometer at 6 AM 55; at 12 M. 64; 6 PM 64.

Saturday, October 29, 1881.

River fell one inch. Chopped wood all day. Commenced raining at 6 P. M. and is still raining at 10 P. M. Prospects very favorable for water in a few days.

Thermometer at 6 A. M. 47; at 12. M. 62; at 6 P. M. 63.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending November 5, 1881.

Sunday October 30, 1881.

River on a stand. Cleaned up boat. Sent a messenger to Arkansas City for mail. Supposed to be about 60 miles air line. Weather clear and pleasant. Thermometer at 6 AM. 46; at 12. M 60 at; 6 P. M. 60.

Monday, October 31, 1881.

River fell one inch. Still cutting wood and waiting for water. Thermometer at A 6 A. M. 45; at 12. M. 69; at 6 P. M. 63.

Tuesday, October

Tuesday, November 1, 1881.

River fell one inch. Weather clear and pleasant. Thermometer at 6 A. M. 63; at 12. M. 68 at 6 P. M. 67.

Wednesday, November 2, 1881.

River at a stand. Weather cloudy and pleasant. Thermometer at 6 A. M. 45; at 12. M. 47; at 6 P. M. 58.

Thursday, November 3, 1881.

River fell half inch. Weather clear and cool. Thermometer at 6 A. M. 33; at 12. M. 55; at 6 P. M. 58.

Friday, November 4, 1881.

River on a stand. Weather clear and pleasant. Thermometer at 6 A. M. 39; at 12. M. 66; at 6 P. M. 58.

Saturday, November 5, 1881.

River on a stand. Sounded over the sand bars near the Boat to-day, found only nine inches of water. Weather clear and pleasant. Thermometer at 6 A. M. 41; at 12. M. 59; at 6 P. M. 53.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending November 12, 1881.

Sunday, November 6, 1881.

No change in the river. Weather cool and cloudy. Thermometer at 6 A. M. 40; at 12 M. 64; at 6 P. M. 60.

Monday, November 7, 1881.

River on a stand. High wind all day. Weather cloudy and pleasant. Thermometer at 6 A. M. 57; at 12. M. 67 at 6 P. M. 59.

Tuesday, November 8, 1881.

River on a stand. Light rain last night. Weather clear and pleasant. Thermometer at 6 A. M. 43; at 12. M. 47; at 6 P. M. 46.

Wednesday, November 9, 1881.

River fell half inch. Weather clear and cool. Thermometer at 6 A. M. 32; at 12. M. 53; at 6 P. M. 51.

Thursday, November 10, 1881.

River rose two inches. Been raining since 12 o'clock last night, and still raining. Prospects more rain. Thermometer at 6 A. M. 42; at 12. M. 43; at 6 P. M. 45.

Friday, November 11, 1881.

River rose one foot. Took on fifteen cords wood and left at 10 o'clock A. M. Pulled and spared over two bars. River commenced falling at 1 o'clock P. M. Had steady 12 hours rain. Cleared up this evening. Wind from northwest. Thermometer at 6 A. M. 45; at 12. M. 49; at 6 P. M. 52.

Saturday, November 12, 1881.

River fell 7 inches. Moved up half mile. River on a stand tonight. Thermometer at 6 A. M. 43; at 12 M. 57; at 6 P. M. 53.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending November 19, 1881.

Sunday, November 13, 1881.

River on a stand. Clear and pleasant. Thermometer at 6 A. M. 39; at 12. M. 51; at 6 P. M. 51.

Monday, November 14, 1881.

River on a stand. Weather cool and clear. Chopped wood all day. Thermometer at 6 A. M. 35; at 12 M. 57 at 6 P. M. 46.

Tuesday, November 15, 1881.

River rose 8 inches. Left at 10 o'clock A. M. Hauled over two bars. Met rise about 3 oclock PM. Moved up 12 miles. River has risen up to this hour, 9 oclock PM. 2 feet. Still rising slow. Stopped for the night at 6 oclock PM. Chopped two cords wood. Weather warm and cloudy. Thermometer at 6 AM. 34; at 12. M. 57; at 6 P. M. 65.

Wednesday, November 16, 1881.

River rose 4 inches, last night. Left at 6 oclock AM. Met fall at 10 oclock AM. Moved up about 40 miles. River fell to-day about one foot, and falling slow. Weather warm and cloudy. Thermometer at 6 AM. 55; at 12. M. 65 at 6 P. M. 64.

Thursday, November 17, 1881.

River fell 5 inches. Left at 7 o'clock AM. Run about 20 miles. Lost six hours on one bar. Hauled over and tied up for the night at 8 o'clock PM. River falling slow. Weather warm and cloudy. Thermometer at 6 A. M. 67; at 12. M. 57; at 6 P. M. 42.

Friday, November 18, 1881.

River fell 2 inches. Cut two cords wood and cleaned out boiler. Left at 10 o'clock AM. Heavy wind all day. Was 5 hours going half mile. Lay up for 3 o'clock PM. Light snow this evening;—first of the season. Weather cold and cloudy, with west wind. Thermometer at 6 AM. 30; at 12. M. 29; at 6 P. M. 29.

Saturday, November 19, 1881.

River fell 2 inches. Lay up for wind and chopped wood till 10 o'clock AM. Hauled over two bars and lay up for the night. Run about one mile. Cut and cleaned about 400 feet of bank. Mostly willow 4 to 8 inches diameter. Thermometer at 6 AM. 20; at 12. M. 29; at 6 PM. 34.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending Saturday, November 26, 1881.

Sunday, November 20, 1881.

River fell one inch. Left at 7 o'clock AM. Pulled and spared all day. Moved up 2 miles. Weather moderating. Thermometer at 6 AM. 27; at 12. M. 37; at 6 P. M. 44.

Monday, November 21, 1881.

River fell one inch. Left at 7 o'clock AM. Found only 12 inches water on first bar. Dropped into bank and tied up. Chopped wood balance of the day. Weather cold and windy. Thermometer at 6 AM. 39; at 12. M. 44; at 6 P. M. 42.

Tuesday, November 22, 1881.

River fell one inch. Waiting for water. Sent mate and 7 men to Arkansas City by wagon to get barge for lighter.

Thermometer at A. M. 6. 32; at 12. M. 41; at 6 P. M. 39.

Wednesday, November 23, 1881.

River fell one inch. Very high wind all day. Weather clear and cold. Thermometer at 6 A. M. 28; at 12. M. 38; at 6 P. M. 33.

Thursday, November 24, 1881.

River on a stand. River full of running ice till 11 o'clock A. M. Weather clear and cold.

Thermometer at 6 A. M. 17; at 12. M. 27; at 6 P. M. 32.

Friday, November 25, 1881.

River on a stand. Weather clear and pleasant. Thermometer at 6 A. M. 29; at 12. M. 52; at 6 P. M. 53.

Saturday, November 26, 1881.

River fell two inches. Weather pleasant. Thermometer at 6 A. M. 31; at 12. M. 55; at 6 P. M. 53.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending December 3, 1881.

Sunday, November 27, 1881.

River fell half inch. Clear and pleasant. Thermometer at 6 A. M. 33; at 12. M. 59; at 6 P. M. 54.

Monday, November 28, 1881.

River fell $\frac{1}{2}$ inch. Weather clear with east wind. Thermometer at 6 A. M. 40; at 12 m. 62; at 6 P. M. 54.

Tuesday, November 29, 1881.

River on a stand. Weather warmer. Thermometer at 6 A. M. 58; at 12. M. 70; at 6 P. M. 64.

Wednesday, November 30, 1881.

River on a stand. Windy all day. Thermometer at 6 A. M. 35; at 12. M. 38; at 6 P. M. 40.

Thursday, December 1, 1881.

River on a stand. Thermometer at 6 A. M. 20; at 12. M. 51; at 6 P. M. 44.

Friday, December 2, 1881.

River fell half inch. Weather warm, prospects rain. Barge and crew arrived to-day from Arkansas City. Will not be able to move till we get more water. Thermometer at 6 A. M. 43; at 12 M. 61; at 6 P. M. 57.

Saturday, December 3, 1881.

River fell one inch. Weather cloudy. Thermometer at 6 A. M. 36; 12. M. 43; at 6 P. M. 41.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending Saturday, December 10, 1881.

Sunday, December 4, 1881.

River on a stand. Weather still cloudy. Thermometer at 6 A. M. 38; 12 M. 41; at 6 P. M. 40.

Monday, December 5, 1881.

River on a stand. Thermometer at 6 A. M. 29; at 12. M. 47; at 6 P. M. 47.

Tuesday, December 6, 1881.

River on a stand. Weather pleasant. Thermometer at 6 A. M. 43; at 12. M. 57; at 6 P. M. 58.

Wednesday, December, 7, 1881.

River falling slow. Weather clam and pleasant. Thermometer at 6 A. M. 38; at 12. M. 44; at 6 P. M. 47.

Thursday, December 8, 1881.

River on a stand. Weather clear and pleasant. Thermometer at 6 A. M. 32; at 12. M. 54; at 6 P. M. 51.

Friday, December 9, 1881.

River fell half inch. Cooler with wind. Thermometer at 6 A. M. 35; at 12. M. 46; at 6 P. M. 45.

Saturday, December 10, 1881.

River fell half inch. Weather cloudy. Thermometer at 6 A. M. 38; at 12. M. 45; at 6 P. M. 47.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

Log Book.

U. S. Snagboat Wichita.

For week ending December 17, 1881.

Sunday, December 11, 1881.

River on a stand. Weather cloudy & windy. Thermometer at 6 A. M. 44; at 12. M. 47; at 6 P. M. 51.

Monday, December 12, 1881.

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Monday, December 12, 1881.

River falling slow. Weather cloudy and warm. Thermometer at 6 A. M. 57; at 12. M. 72; at 6 P. M. 69.

Tuesday, December 13, 1881.

River still falling. High wind all day. Thermometer at 6 A. M. 55; at 12. M. 51; at 6 P. M. 46.

Wednesday, December 14, 1881.

River stationary. Weather clear an cooler. Thermometer at 6 A. M. 27, at 12. M. 38; at 6 P. M. 42.

Thursday, December 15, 1881.

River falling. Windy all day. Thermometer at 6 A. M. 32; at 12 M. 57; at 6 P. M. 48.

Friday December 16, 1881.

River falling slow. Clear and pleasant. Thermometer at 6 A. M. 34; at 12. M. 51; at 6 P. M. 46.

Saturday, December 17, 1881.

River on a stand. Thermometer at 6 A. M. 37; at 12. M. 52; at 6 P. M. 52.

JAMES F. EVINS, Clerk.

Approved: Joseph Evins, Capt.

Log Book.

U. S. Snagboat Wichita.

For week ending December 24, 1881.

Sunday, December 18, 1881.

River still falling. Weather cloudy and pleasant. Thermometer at 6 A. M. 35; at 12 M. 54; at 6 P. M. 52.

Monday, December 19, 1881.

River stationary. Weather cloudy with warm rain. Prospects more rain soon. Thermometer at 6 A. M. 47; at 12 M. 51. at 6 P. M. 51.

Tuesday, December 20, 1881.

River at a stand. Rained all last night. Light snow to-day, and very windy. Thermometer at 6 AM. 40; at 12. M. 34; at 6 P. M. 38.

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Wednesday, December 21, 1881.

River stationary. Snowed nearly all day. Still cool nad windy. Thermometer at 6 A. M. 33; at 12 M 35; at 6 P. M. 34.

Thursday, December 22, 1881.

River on a stand. Thermometer at 6 A. M. 32; at 12 M. 37; at 6 P. M. 34.

Friday, December 23, 1881.

River falling. Weather cloudy and pleasant. Thermometer at 6 A. M. 32; at 12. 44; at 6 P. M. 47.

Saturday, December 24, 1881.

River falling slowly. Clear and pleasant. Thermometer at 6 A. M. 31; at 12. M. 51; at 6 P. M. 47.

JAMES F. EVINS, Clerk.

Approved.

Joseph Evins.
Capt.

Log Book.

U. S. Snagboat Wichita.

For week ending December 31, 1881.

Sunday, December 25, 1881.

River stationary. Thermometer at 6 A. M. 40; at 12 M. 54;
at 6 P. M. 50.

Monday, December 26, 1881.

River falling. Clear and pleasant. Thermometer at 6 A. M.
37; at 12. M. 48; at 6 P. M. 46.

Tuesday, December 27, 1881.

River fell half inch. Weather pleasant. Thermometer at 6
A. M. 37; at 12 M. 43; at 6 P. M. 47.

Wednesday, December 28, 1881.

River falling slowly. Clear and pleasant. Thermometer at 6
A. M. 33; at 12. M. 44; at 6 P. M. 46.

Thursday, December 29, 1881.

River continues to fall. Weather some cooler. Thermometer
at 6 A. M. 34; at 12. M. 44; at 6 P. M. 43.

Friday, December 30, 1881.

River fell one inch. Weather cool. Thermometer at 6 A. M.
27; at 12. M. 37; at 6 P. M. 37.

Saturday, December 31, 1881.

287 6 A. M. 36; at 12. M. 56; at 6 P. M. 38.

JAMES F. EVINS, Clerk.

Approved:

Joseph Evins, Capt.

Log Book.

U. S. Snagboat Wichita.

For week ending January 7, 1882.

Sunday, January 1, 1882.

River falling. Cold and windy. Thermometer at 6 A. M. 20;
at 12 M. 37; at 6 P. M. 32.

Monday, January 2, 1882.

River falling. Clear and cool. Thermometer at 6 A. M. 26; at
12 M. 45; at 6. P. M. 38.

Tuesday, January 3, 1882.

River stationary. Weather cloudy. Thermometer at 6 A. M. 36; at 12. M. 46; at 6 P. M. 40.

Wednesday, January 4, 1882.

River fell $\frac{1}{2}$ inch. Weather cloudy, north wind. Thermometer at 6 A. M. 34; at 12. M. 36; at 6 P. M. 34.

Thursday, January 5, 1882.

River stationary. Weather cloudy. Thermometer at 6 A. M. 34; at 12 M. 36; at 6 P. M. 34.

Friday, January 6, 1882.

River rose 1 inch. Weather cloudy. Thermometer at 6 A. M. 32; at 12. M. 36; at 6 P. M. 40.

Saturday, January 7, 1882.

River on a stand. Thermometer at 6 A. M. 36; at 12 M. 46; at 6 P. M. 52.

JOSEPH EVINS, Capt.

Log Book.

U. S. Snagboat Wichita.

Week ending January 14, 1882.

Sunday, January 8, 1882.

River fell $\frac{1}{2}$ inch. Thermometer at 6 A. M. 56; at 12 M. 70; at 6 P. M. 52.

Monday, January 9, 1882.

River stationary. Thermometer at 6 A. M. at 12 M. 44; at 6 P. M. 42.

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Tuesday, January 10, 1882.

River fell $\frac{1}{2}$ inch. Weather cloudy. Thermometer at 6 A. M. 39; at 12. M. 49; at 6 P. M. 40.

Wednesday, January 11, 1882.

River stationary: Light rain. Thermometer at 6 A. M. 34; at 12. M. 46; at 6 P. M. 42.

Thursday, January 12, 1882.

River rose 1 inch. Weather fair. Thermometer at 6 A. M. 36; at 12. M. 40; at 6 P. M. 41.

Friday, January 13, 1882.

River on stand. Weather fair. Thermometer at 6 A. M. 36; at 12. M. 40; at 6 P. M. 41.

Saturday, January 14, 1882.

River fell $\frac{1}{4}$ inch. Weather fair. Thermometer at 6 A. M. 30; at 12. M. 46; at 6 P. M. 42.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For the week ending Saturday, January 21, 1882.

Sunday, January 15, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 48; at 12. M. 60; at 6 P. M. 59.

Monday, January 16, 1882.

River on stand. North wind with snow. Thermometer at 6 A. M. 24; at 12. M. 18; at 6 P. M. 16.

Tuesday, January 17, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 12; at 12. M. 25; at 6 P. M. 22.

Wednesday, January 18, 1882.

River fell $\frac{1}{2}$ inch. Fair. Thermometer at 6 A. M. 20; at 12. M. 32; at 6 P. M. 30.

Thursday, January 19, 1882.

River fell 1 inch. Weather clear. Thermometer at 6 A. M. 20; at 12. M. 40; at 6 P. M. 36.

Friday, January 20, 1882.

River on stand. Cloudy. Thermometer at 6 A. M. 36; at 12 M. 40; at 6 P. M. 40.

Saturday, January 21, 1882.

River rose $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 37; at 12 M. 47; at 6 P. M. 40.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

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Sunday, 22nd, 1882.

River on stand. Clear. Thermometer at 6 A. M. 21; at 12. M. 40; at 6 P. M. 35.

Monday, January 23, 1882.

River on stand. Clear. Thermometer at 6 A. M. 26; at 12 M. 44; at 6 P. M. 36.

Tuesday, January 24, 1882.

River rose $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 36; at 12 M. 42; at 6 P. M. 44.

Wednesday, January 25, 1882.

River on stand. Cloudy. Thermometer at 6 A. M. 48; at 12 M. 56; at 6 P. M. 54.

Thursday, January 26, 1882.

River on stand. Cloudy. Thermometer at 6 A. M. 54; at 12 M. 51; at 6 P. M. 47.

Friday, January 27, 1882.

River fell $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 34; at 12 M. 46; 6 P. M. 44.

Saturday, January 28, 1882.

River on stand. Cloudy. Thermometer at 6 A. M. 24; at 12 M. 28; at 6 P. M. 28.

JOSEPH EVINS,

Capt. U. S. Snagboat Wichita.

For week ending Saturday, February 4, 1882.

Sunday, January 29, 1882.

River fell $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 20 at 12 M. 31; at 6 P. M. 30.

Monday, January 30, 1882.

River fell $\frac{1}{2}$ inch. Snowing. Thermometer at 6 A. M. 28 at 12 M. 32; at 6 P. M. 31.

Tuesday, January 31, 1882.

River on stand. Clear. Thermometer at 6 A. M. 15; at 12 M. 39; at 6 P. M. 32.

Wednesday, February 1, 1882.

River on stand. Clear. Thermometer at 6 A. M. 28; 12 M. 50; at 6 P. M. 40.

Thursday, February 2, 1882.

River rose 1 inch. Clear. Thermometer at 6 A. M. 28; 290 at 12 M. 48; at 6 P. M. 44.

Friday, February 3, 1882.

River fell 1 inch. Clear. Thermometer at 6 A. M. 30; at 12 M. 45; at 6 P. M. 48.

Saturday, February 4, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 32; at 12. M. 47; at 6 P. M. 41.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For the week ending Saturday, February 11, 1882.

Sunday, February 5, 1882.

River stationary. Weather clear. Thermometer at 6 A. M. 40; at 12. M. 70; at 6 P. M. 67.

Monday, February 6, 1882.

River stationary. Weather clear. Thermometer at 6 A. M. 55; at 12. M. 67; at 6 P. M. 62.

Tuesday, February 7, 1882.

River rose $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 50; at 12. M. 39; at 6 P. M. 36.

Wednesday, February 8, 1882.

River on stand. Clear. Thermometer at 6 A. M. 30; at 12. M. 44; at 6 P. M. 42.

Thursday, February 9, 1882.

River fell $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 31; at 12. M. 65; at 6 P. M. 61.

Friday, February 10, 1882.

River stationary. Clear. Thermometer at 6 A. M. 56; at 12. M. 64; at 6 P. M. 62.

Saturday, February 11, 1882.

River fell 1 inch. Cloudy. Thermometer at 6 A. M. 54 at 12. M. 71; at 6 P. M. 66.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For week ending Saturday, February 18, 1882.

Sunday, February 12, 1882.

River stationary. Clear. Thermometer at 6 A. M. 58; at 12 M. 70; at 6 P. M. 62.

Monday, February 13, 1882.

River fell $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 54; at 12 M. 68; 6 P. M. 63.

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Tuesday, February 14, 1882.

River stationary. Clear. Thermometer at 6 A. M. 52; at 12 M. 67; at 6 P. M. 51.

Wednesday, February 15, 1882.

River rose 1 inch. Cloudy. Thermometer at 6 A. M. 58; at 12 M. 64; at 6 P. M. 59.

Thursday, February 16, 1882.

River rose $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 62; at 12 M. 60; at 6 P. M. 47.

Friday, February 17, 1882.

River rose 1 inch. Cloudy. Thermometer at 6 A. M. 35; at 12 M. 41; at 6 P. M. 39.

Saturday, February 18, 1882.

River stationary. Cloudy. Thermometer at 6 A. M. 35; at 12 M. 41; at 6 P. M. 39.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For week ending Saturday, February 25, 1882.

Sunday, February 19, 1882.

River fell 1 inch. Cloudy. Thermometer at 6 A. M. 32; at 12 M. 28; at 6 P. M. 30.

Monday, February 20, 1882.

River stationary. Cloudy. Thermometer at 6 A. M. 29; at 12 M. 34; at 6 P. M. 31.

Tuesday, February 21, 1882.

River fell one inch. Clear. Thermometer at 6 A. M. 18; at 12 M. 33; at 6 P. M. 31.

Wednesday, February 22, 1882.

River fell 1 inch. Clear. Thermometer at 6 A. M. 20; at 12 M. 50; at 6 P. M. 44.

Thursday, February 23, 1882.

River fell $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 28; at 12 M. 58; at 6 P. M. 49.

Friday, February 24, 1882.

River on stand. Clear and windy. Thermometer at 6 A. M. 48; at 12 M. 58; at 6 P. M. 54.

Saturday, February 25, 1882.

River stationary. Cloudy. Light rain. Thermometer
292 at 6 A. M. 53; at 12 M. 49; at 6 P. M. 48.

JOSEPH EVINS,

Capt. U. S. Snagboat Wichita.

For week ending March 4, 1882.

Sunday, February 26, 1882.

River rose 2 inches. Light rain. Thermometer at 6 A. M.
48; at 12. M. 51; at 6 P. M. 49.

Monday, February 27, 1882.

River rose 3 inches. Clear and warm. Raised steam and
left for Fort Smith at 10 o'clock A. M. with barge in tow.
Spared the balance of the day. Moved down $\frac{1}{4}$ mile. Thermo-
meter at 6 A. M. 55; at 12 M. 69; at 6 P. M. 72.

Tuesday, February 28, 1882.

River rose 8 inches. Left at 7 o'clock A. M. Heavy north
wind all day. Hauled over 2 crossings. Moved down 1 mile.
Thermometer at 6 A. M. 65; at 12. M. 50; at 6 P. M. 46.

JOSEPH EVINS, Capt.

Wednesday, March 1, 1882.

River on stand. Clear and calm. Left at 7 o'clock A. M.
Hauled and spared over 4 crossings. Lost an hour working
on capstan. Broke 2 spars. Replaced the, from the woods.
Found 14 inches water today. Moved down 3 miles. Thermo-
meter at 6 A. M. 54; at 12 M. 76; at 6 P. M. 71.

Thursday, March 2, 1882.

River stationary. Left at 6 $\frac{1}{2}$ o'clock A. M. Found 16 in-
ches water. Very narrow and crooked. Moved down about
6 miles. Thermometer at 6 A. M. 59; at 12 M. 77; at 6 P. M. 67.

Friday, March 3, 1882.

River fell 1 inch. Left at 6 o'clock A. M. Found as little as
14 inches in the channel. Lost 5 hours for wind. Moved down
about 7 miles. Thermometer at 6 A. M. 60; at 12 M. 81; at 6 P.
M. 74.

Saturday, March 4, 1882.

River stationary. Left at 6½ o'clock A. M. Lay up at 9 A. M. for wind. Left again at 4 P. M. Moved down about 6 miles. Run on sand bar. Spared off and lay up for the night at all o'clock P. M. Thermometer at 6 A. M. 68; at 12 M 70; at 6 P. M. 64.

JOSEPH EVINS,
Capt.

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Log Book.

U. S. Snagboat Wichita.

For week ending March 11, 1882.

Sunday, March 5, 1882.

Cleaned out boilers. Left at 9 o'clock A. M. Moved down 3 miles. Lay up for wind. Chopped wood till night. Rain fell 1 inch. Thermometer at 6 A. M. 41; at 12 M. 40; at 6 P. M. 34.

Monday, March 6, 1882.

Lay up for wind till 1 o'clock P. M. Moved down ½ mile. Hauled over less than 14 inches water on 1 crossing. Lay up for the night at 7 o'clock P. M. Thermometer at 6 A. M. 27; at 12 M. 34; at 6 P. M. 41.

Tuesday, March 7, 1882.

River fell 2 inches. Left at 7 o'clock A. M. Found only 9 inches water. Spared 6 hours. Failed to get over too cold to handle rigging in the water. Spared off and lay up at the main shore at 5 o'clock P. M. Been snowing since noon. Thermometer at 6 A. M. 28; at 12. M. 28; at 6 P. M. 27.

Wednesday, March 8, 1882.

River stationary. Lay up all day. Chopped 3 cords wood. Snowing and raining. Thermometer at 6 A. M. 27; at 12 M. 31; at 6 P. M. 37.

Thursday, March 9, 1882.

River stationary. Lay up all day. Heavy north wind. Thermometer at 6 A. M. 29; at 12 M. 36; at 6 P. M. 34.

Friday, March 10, 1882.

Left at 8 o'clock A. M. Worked all day on one bar. Spared over. Moved down ½ mile. Broke 1 spar. Replaced it from the woods. Thermometer at 6 A. M. 26; at 12. M. 48; at 6 P. M. 48.

Saturday, March 11, 1882.

Left at 7 o'clock A. M. Spared all day on 2 crossings. Moved down about $\frac{1}{2}$ mile. Cut one cord wood. Broke spar. Got another from the shore. Thermometer at 6 A. M. 40; at 6 P. M. 56; at 6 P. M. 63.

JOSEPH EVINS, Capt.

For the week ending March 18, 1882.

Sunday, March 12, 1882.

River on stand. Left at 7 o'clock A. M. Pulled over 1 crossing. Found only 10 inches water. Lay up. Cleaned up the boat. Cut 2 cords wood and 2 spars. Heavy wind all day.

Thermometer at 6 A. M. 48; at 12 M. 49; at 6 P. M. 57.

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Monday, March 13, 1882.

River fell 1 inch. Found 12 to 14 inches water on the crossings. Lay up for night at 7 o'clock P. M. Thermometer at 6 A. M. 40; at 12 M. 64; at 6 P. M. 68.

Tuesday, March 14, 1882.

River rose 1 inch. Left at 6 $\frac{1}{2}$ o'clock A. M. Worked on 1 crossing till 4 o'clock. Hauled over 9 inches water. Lay up. Overhauled rigging. Cleaned up boat and chopped wood balance of the day. Thermometer at 6 A. M. 58; 12 M. 84; at 6 P. M. 76.

Wednesday, March 15, 1882.

Chopped wood and sounded the river till 4 o'clock P. M. River rose 4 inches. Moved down about 3 miles. Thermometer at 6 A. M. 60; at 12 M. 64; at 6 P. M. 64.

Thursday, March 16, 1882.

River rose 4 inches. Left at 7 o'clock. High wind all day. Moved down about 6 miles. Chopped 2 cords wood. Lay up for the night at 7 o'clock P. M. Thermometer at 6 A. M. 64; at 12 M. 74; at 6 P. M. 78.

Friday, March 17, 1882.

River on stand. Too much wind to run till 5 o'clock P. M. Moved down 2 miles. Cut 2 cord wood. Thermometer at 6 A. M. 67; at 12 M. 78; at 6 P. M. 74.

Saturday, March 18, 1882.

River fell 2 inches. Left at 7 o'clock A. M. Hauled over 4 crossings today. Moved down 12 miles. Lay up for the

night at 9 o'clock P. M. Thermometer at 6 A. M. 69; at 12 M. 70; at 6 P. M. 64.

JOSEPH EVINS, Capt.

For the week ending March 25, 1882.

Sunday, March 19, 1882.

River fell 2 inches. Left at 6½ o'clock. Spared over 2 bars. Landed at wood yard. Took on 12 cords wood. Cleaned out boilers. Moved down 1 mile. Light rain since 12 o'clock M. Thermometer at 6 A. M. 58; at 12 M. 67; at 6 P. M. 65.

Monday, March 20, 1882.

Rain fell 2 inches. Left at 7 o'clock A. M. Pulled over 2 bars and lay up for wind the balance of the day. Thermometer at 6 A. M. 64; at 12 M. 75; at 6 P. M. 54.

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Tuesday, March 21, 1882.

River fell 3 inches. Left at 6 o'clock A. M. Spared over 4 bars. Lost 5 hours for wind. Moved down about 1 mile. Thermometer at 6 A. M. 36; at 12 M. 50; at 6 P. M. 58.

Wednesday, March 22, 1882.

River fell 1 inch. Left at 6½ o'clock A. M. The river is now very low. Only about 12 inches. Had to spar and haul over half the distance made today. Broke one spar. Moved down about 1 mile. Thermometer at 6 A. M. 30; at 12 M. 60; at 6 P. M. 61.

Thursday, March 23, 1882.

River fell 1 inch. Left at 7 o'clock A. M. Spared and pulled all day. Found but 10 inches water. Parted 2 lines. Pulled down 5 trees. Spared the boat in good position and lay for the night at 7 o'clock P. M. Thermometer at 6 A. M. 54; at 12 M. 60; at 6 P. M. 58.

Friday, March 24, 1882.

River fell 1 inch. Spared off. Hauled the boat back into deep water and lay up for a rise. Thermometer at 6 A. M. 40; at 12 M. 54; at 6 P. M. 52.

Saturday, March 25, 1882.

River fell 1 inch. Overhauled and cleaned up boat. Thermometer at 6 A. M. 54; at 12 M. 68; at 6 P. M. 64.

JOSEPH EVINS, Capt.

For week ending Saturday April 1, 1882.

Sunday, March 26, 1882.

River fell 2 inches. Too low to move, light rain last night
Wind from south. Thermometer at 6 A. M. 58; at 12 M. 76 at 6
P. M. 78.

Monday, March 27, 1882.

River fell 1 inch. Raining. Chopping wood. It will re-
quire one foot more water to get away from here. Thermo-
meter at 6 A. M. 60; at 12 M. 56; at 6 P. M. 48.

Tuesday, March 28, 1882.

River fell 1 inch. Weather clear and cool. Chopping wood
and cording on the shore. Thermometer at 6 A. M. 31; at 12
M. 73; at 6 P. M. 66.

Wednesday, March 29, 1882.

River fell 2 inches. Sounded the river to the mouth of the
Cimarron about 4 miles. Found only 7 inches water. The
Cimarron is very low.

296 South wind with prospects of rain. Thermometer at 6
A. M. 55; at 12 M. 80; at 6 P. M. 70.

Thursday, March 30, 1882.

River fell 1 inch. Weather clear and windy. Thermometer at
6 A. M. 40; at 12 M. 72; at 6 P. M. 70.

Friday, March 31, 1882.

River fell 1 inch. Weather clear and warm. Thermometer at
6 A. M. 50; at 12 M. 82; at 6 P. M. 72.

Saturday, April 1, 1882.

River fell 1 inch. Weather clear and calm. Thermometer at
6 A. M. 62; at 12 M. 83; at 6 P. M. 78.

JOSEPH EVINS, Capt.

For the week ending April 8, 1882.

Sunday, April 2, 1882.

River fell 1 inch. Clear and warm. Thermometer at 6 A. M.
68; at 12 M. 80; at 6 P. M. 78.

Monday, April 3, 1882.

River fell $\frac{1}{2}$ inch. Clear and pleasant. Thermometer at 6
A. M. 64; at 12 M. 82; at 6 P. M. 76.

Tuesday, April 4, 1882.

River stationary. Clear and pleasant. Thermometer at 6 A. M. 64; at 12 M. 78; at 6 P. M. 71.

Wednesday, April 5, 1882.

River stationary. Weather cloudy. Strong south wind. Thermometer at 6 A. M. 64; at 12 M. 71; at 6 P. M. 69.

Thursday, April 6, 1882.

River stationary. Weather cloudy. Thermometer at 6 A. M. 64; at 12 M. 80; at 6 P. M. 78.

Friday, April 7, 1882.

River stationary. Weather cloudy. Light rain. Thermometer at 6 A. M. 68; at 12 M. 77; at 6 P. M. 72.

Saturday, April 8, 1882.

River rose $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 60; at 12 M. 78; at 6 P. M. 76.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

Log Book.

297 United States Snagboat Wichita.

For the week ending Saturday, April 15, 1882.

Sunday, April 9, 1882.

River fell 1 inch. Weather clear. The river is now lower than it has been for two years. About 5 inches water over the shoalest part. Thermometer at 6 A. M. 50; at 12 M. 71; at 6 P. M. 70.

Monday, April 10, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 45; at 12 M. 67; at 6 P. M. 54.

Tuesday, April 11, 1882.

River stationary. Weather cloudy. Southeast wind. Thermometer at 6 A. M. 50; at 12 M. 54; at 6 P. M. 51.

Wednesday, April 12, 1882.

River rose $1\frac{1}{2}$ inches. Weather cloudy. Thermometer at 6 A. M. 42; at 12 M. 50; at 6 P. M. 46.

Thursday, April 13, 1882.

River rose $3\frac{1}{2}$ inches. Weather cloudy. North wind. Thermometer at 6 A. M. 39; at 12 M. 50; at 6 P. M. 48.

Friday, April 14, 1882.

River rose 3 inches. Cloudy. North wind. Thermometer at 6 A. M. 42; at 12 M. 52; at 6 P. M. 50.

Saturday, April 15, 1882.

River rose 2 inches. Weather clear. Thermometer at 6 A. M. 35; at M. 58; at 6 P. M. 54.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For the week ending Saturday, April 22nd, 1882.

Sunday, April 16, 1882

River fell $\frac{1}{2}$ inch. Thermometer at 6 A. M. 30; at 12 M. 64; at 6 P. M. 64.

Monday, April 17, 1882.

River fell $1\frac{1}{2}$ inches. Weather clear. Thermometer at 6 A. M. 50; at 12 M. 86; at 6 P. M. 68.

Tuesday, April 18, 1882.

River fell $1\frac{1}{2}$ inches. Weather clear. Thermometer at 6 A. M. 64; at 12 M. 96; at 6 P. M. 72.

Wednesday, April 19, 1882.

River fell 1 inch. Weather clear. Thermometer at 6 A. M. 46; at 12 M. 65; at 6 P. M. 62.

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Thursday, April 20, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 43; at 12 M. 80; at 6 P. M. 84.

Friday, April 21, 1882.

River fell $\frac{1}{2}$ inch. Weather clear and calm. Thermometer at 6 A. M. 52; at 12 M. 82; at 6 P. M. 80.

Saturday, April 22, 1882.

River stationary. Light rain. Cool and cloudy. Thermometer at 6 A. M. 50; at 12 M. 64; at 6 P. M. 58.

JOSEPH EVINS,
Capt. U. S. Snagboat Wichita.

For the week ending Saturday, April 29, 1882.

Sunday, April 23, 1882.

River fell $\frac{1}{2}$ inch. Cloudy and cool. Thermometer at 6 A. M. 47; at 12 M. 64; at 6 P. M. 56.

Monday, April 24, 1882.

River fell $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 48; at 12 M. 69; at 6 P. M. 64.

Tuesday, April 25, 1882.

River fell $\frac{1}{2}$ inch. Weather clear. Thermometer at 6 A. M. 66; at 12 M. 82; at 6 P. M. 80.

Wednesday, April 26, 1882.

River fell $\frac{1}{2}$ inch. Cloudy. Thermometer at 6 A. M. 70; at 12 M. 82; at 6 P. M. 76.

Thursday, April 27, 1882.

River fell $\frac{1}{2}$ inch. Clear. Thermometer at 6 A. M. 56; at 12 M. 80; at 6 P. M. 75.

Friday, April 28, 1882.

River fell $\frac{1}{2}$ inch. Raining. Thermometer at 6 A. M. 62; at 12 M. 64; at 6 P. M. 62.

Saturday, April 29, 1882.

River stationary. Clear and cool. Thermometer at 6 A. M. 52; at 12 M. 70; at 6 P. M. 64.

JOSEPH EVINS,

Capt. U. S. Snagboat Wichita.

Week ending Saturday, May 6, 1882.

Sunday, April 30, 1882.

River rose 1 inch. Thermometer at 6 A. M. 45; at 12 M. 70; at 6 P. M. 64.

299

Monday, May 1, 1882.

River fell 1 inch. Clear. Thermometer at 6 A. M. 54; at 12 M. 76; at 6 P. M. 66.

Tuesday, May 2m 1882.

River stationary. Raining. Thermometer at 6 A. M. 58; at 12 M. 64; at 6 P. M. 68.

Wednesday, May 3, 1882.

River rose 1 inch. Rained 3 hours, about one inch fall last night. Weather cloudy indicates more rain. Thermometer at 6 A. M. 62; at 12 M. 72; at 6 P. M. 76.

Thursday, May 4, 1882.

River stationary. Cloudy. Thermometer at 6 A. M. 73; at 12 M. 90; at 6 P. M. 82.

Friday, May 5, 1882.

River rose 7 inches. Clear. Left at 5 o'clock having laid here since March 24th. Found 15 inches water. Moved down about 45 miles hauled over six crossing with line. Lay up for the night of 7½ o'clock P. M. Thermometer at 6 A. M. 80; at 12 M. 89; at 6 P. M. 88.

Saturday, May 6, 1882.

River rose 1½ inches. Cloudy. Left at 5 o'clock A. M. Heavy north wind. Passed down about 8 miles. Lost six hours. Lay up for wind. Thermometer at 6 A. M. 62; at 12 M. 81 at 6 P. M. 71.

JOSEPH EVINS.

Capt. U. S. Snag Boat Wichita.

For week ending Saturday, May 13, 1882.

Sunday, May 7, 1882.

River rose 14½ inches, last night. Heavy rain 9 hours, still raining. Left at 5½ o'clock A. M. Run down about 50 miles. Lost 4 hours for wind. Lay up for the night at 8 o'clock P. M. Thermometer at 6 A. M. 64; at 12 M. 70; at 6 P. M. 64.

Monday, May 8, 1882.

River rose 5 inches. Weather clear. Left at 5 o'clock A. M. Landed at Weallacke and took 12 cords wood. Left Wallacke at 12 M. and run down to M. K. & T. R. R. Bridge about 75 miles. Heavy storm rain and hail. Wind prevented lowering chimneys. Lay above the bridge for the night. The rain fall in the last 5 days about 5 inches. Thermometer at 6 A. M. 66; at 12 M. 80; at 6 P. M. 64.

Tuesday, May 9, 1882.

River fell 1 inch. Passed under the bridge and left at 8 o'clock A. M. Arrived at Fort Gibson at 9 A. M. and
300 left at 10 A. M. for Fort Smith. Weather cloudy with high south wind. Landed at Russells wood yard. Took

5½ cords wood. Lay up for the night at 7 o'clock P. M. Run down to-day about 100 miles. Thermometer at 6 A. M. 64; at 12 M. 70; at 6 P. M. 67.

Wednesday, May 10, 1882.

River rose 6 inches. Clear. Worked on wheel till 7 o'clock. Arrived at Fort Smith at 9 o'clock A. M. Cooled down. Clean-up boat and lay up balance of the day. Thermometer at 6 A. M. 58; 12 M. 78; at 6 P. M. 72.

Thursday, May 11, 1882.

River fell 2 inches. Weather clear. Cleaned out boilers. Oiled up and paid off and lay up in mouth Poteau. Water too high for snagging purposes. Thermometer at 6 A. M. 47; at 12 M. 50; at 6 P. M. 48.

Friday, May 12, 1882.

River fell 1 inch. Weather clear. Thermometer at 6 A. M. 48; at 12 M. 48; at 6 P. M. 49.

Saturday, May 13, 1882.

River fell 20 inches. Weather cloudy. Thermometer at 6 A. M. 49; at 12 M. 60; at 6 P. M. 57.

JOSEPH EVINS,

Capt. U. S. Snagboat Wichita.

301 Government here offered in evidence as Exhibit 34 extract from pages 5 and 1576 of Annual Report of Chief of Engineers for 1882, with reference to Arkansas River, reading:

“Arkansas River, between Fort Smith, Arkansas, and Wichita, Kansas. The object of this improvement is to remove snags, rocks, overhanging trees, and other obstructions to navigation between the two points designated, and thus provide a means of water transportation to market for the surplus products of a large portion of Western Kansas and Indian Territory.

The snag-boat designed for this work, which was in process of construction at the close of last year, was finished and dispatched to the field on the 28th of September last.

Early in October it reached the mouth of Grand River, 95 miles above Fort Smith. Above this point the water was found to be unprecedentedly low, and divided by numerous sandbars and islands into many channels. For seven months this boat was in the upper reach of the river, never being able

to get above the Pawnee Agency Landing in Indian Territory or back to Fort Gibson. Early in May a rise in the river brought the boat out. From that time until the end of the year its operations were confined to the reach of the river between Fort Smith, Arkansas, and Fort Gibson, Indian Territory.

Before this river can be made available for navigable purposes above the mouth of Grand River in Indian Territory, except at high stages, it would seem that some works for concentrating the water into one channel are an absolute necessity. To submit an intelligent report with estimates of the cost of improvements of this nature covering so large an extent of river, an accurate map with all navigable data bearing upon the subject should be at hand.

The officer in charge renews the recommendation of last year for an appropriation of \$16,300 for this survey from Little Rock, Ark., up to Wichita, Kans."

"Improvement of the Arkansas River between Fort Smith, Arkansas, and Wichita, Kansas.

Work under this appropriation during the year was confined to the operations of the snag-boat Wichita, which was under process of construction and nearly finished at the end of last season. The boat is designed especially for work upon this reach of the Arkansas. It is 125 feet long, 26 feet wide, 3 feet depth of hold, and draws 15 inches. It has accommodations for a crew of 25 officers and men, with their outfit and supplies.

The boat is propelled by two engines, 8½ inches in diameter, 3 feet stroke, supplied with steam from two steam boilers 36 inches diameter, 16 feet long, with four lap-welled flues in each, two 8 inches, and two 10 inches. The hoisting power is supplied by a steam capstan, with double reversible engines 6 by 12 inches. The spindle is steel, 5 inches diameter. This power is applied through a crane capable of lifting between 40 and 50 tons. The outfit of rope, tackle, saws, axes, &c., is complete. In every way the boat seems well adapted to her work.

On the 28th of September, 1881, the boat was finished, and left Little Rock for the field of its operations.

302 The design was that it should proceed as rapidly as practicable to Arkansas City, Kans., doing only such work as was necessary to effect its own passage, and when

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7
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that point was reached it was to turn back and remove such obstructions as would be necessary in order to insure a navigable channel. No difficulty was experienced in carrying out this programme until the boat reached the mouth of Verdigris River, which empties into the Arkansas about 100 miles above Fort Smith. Above this point the character of the river entirely changed. The channels were very crooked and obstructed with numerous sandreefs. In the bed of the river were many islands, tow-heads, and sand-bars that divided the water and prevented any one well defined channel being formed.

Whilst there was plenty of water to have given a good channel 3 feet deep and 300 feet wide, had it all been concentrated, it was with difficulty that one was found to float the boat, then drawing about 16 inches.

With great effort, and many delays on account of these difficulties, the boat succeeded, on the 21st of November, in reaching the Pawnee Agency Landing. This point is estimated to be about 270 miles above Fort Smith and 75 miles below Arkansas City.

After some delay at this place, instructions were sent to the captain of the boat to the effect that if he could not get up the river farther, he was authorized to withdraw from this upper reach of the river and confine his operations for the balance of the season to the reach between Fort Smith, Arkansas, and the mouth of the Grand River, in Indian Territory, or, if he could not do either, to discharge the greater portion of his crew and keep only a sufficient number of men to guard the boat and bring it down the river in case of a sudden rise should occur. Until the 26th of February the boat lay at this place, being unable to get either up or down. A slight rise having taken place on the following day, it started down the river and succeeded in getting about 90 miles and near the mouth of the Cimarron River. Here there was another delay for want of water until May 5, 1882. On the 9th of May the boat reached the mouth of the Grand River, having been absent from this point just seven months.

Since this time active operations have been in progress between the mouth of Grand River and Fort Smith, Ark.

Although these eleven months were not fruitful of much work accomplished for the benefit of navigation, the experience was valuable in one respect. It demonstrated the absolute necessity for concentrating the water that is running over

the bottom of this reach of the river, in many small channels or rivulets, into some one which shall carry it all, if it is ever to be made available for navigable purposes. The water in this portion of the river is said to have been exceptionally low during all those months, yet there is no doubt but that if it had been concentrated into a single channel of 200 or 300 feet width, there would have been a depth of from $2\frac{1}{2}$ to 3 feet. The greater portion of the river throughout this reach flows over an exceptionally wide bottom, which is cut up, as before mentioned, by numerous islands and sandbars.

To enter upon the work of concentration without first having made an accurate map of the river from an instrumental survey, and thoroughly studied all the conditions of the problem, would be injudicious, and might probably result in great waste of the public money.

303 That the improvement of the river is feasible, and within reasonable limits of expense, there can be no doubt, and that it would be of inestimable value to a large section of country rich both in mineral and agricultural products there can also be no doubt.

It is to be hoped that funds can, at an early day, be made available for the prosecution of this survey. In the mean time the plan of improvement already approved, which is the removal of snags, rocks, and other obstructions to navigation, can be carried forward as far as funds made available will suffice, in those portions of the river where concentration is not an absolute necessity.

During the month of June some slight repairs were made to the dike at Fort Smith, Ark., by the addition of 440 brush mattresses 16 by 4 by 1 foot and 80 tons of stone."

Government here offered in evidence as Exhibit 35 page 1168 of Report of Chief of Engineers for 1883, reading:

"4. Arkansas River between Fort Smith, Arkansas, and Wichita, Kansas. The object of this improvement is to remove snags, rocks, overhanging trees and other obstructions to navigation between the points named and thus provide a means of water transportation for the surplus products of a large portion of Western Kansas and the Indian Territory.

The work of last season was confined to the operations of the snag-boat Wichita, during the months of July, August,

and September, upon that reach of the river between Fort Smith, Ark., and Fort Gibson, Indian Territory.

The commerce of this portion of the river was greatly benefited by the work done.

It is proposed during the coming season to continue the snagging operations, and also to remove some gravel shoals and ledges of rock that are troublesome to navigation during the low-water season."

"Improvement of Arkansas River Between Fort Smith, Arkansas, and Wichita, Kansas.

The work during the season on this portion of the Arkansas River was confined to the snagging operations of the snag-boat Wichita. Her operations commenced on the 1st day of July, and were carried on until the end of September over that reach of the river lying between Fort Smith, Ark., and the mouth of the Grand River, Indian Territory.

During this time seven hundred and nine snags, weighing in the aggregate 1350 tons, and twenty drift piles were removed, three hundred and thirty eight trees were cut down, and two hundred and six deadened, to prevent them falling into the river and forming obstructions to navigation. The work done was a very great benefit to the commerce of this portion of the river. On the 1st of October, the Wichita left this locality and worked during the remainder of the season between Fort Smith and the mouth of the river.

It is proposed during the coming season to continue the snagging operations, and also to remove some gravel shoals and ledges of rock that are troublesome to navigation during the low water season.

I have been unable to get any recent reliable data as to the amount of river commerce in the Indian Territory other than that during this season the amount has increased very much over that of last."

304 Government here offered in evidence as Exhibit 36 page 1399 of Report of Chief of Engineers for 1884, reading:
p. 1399

"Improvement of Arkansas River, between Fort Smith, Arkansas and Wichita, Kansas.

Operations during the year under this head were confined to the reach below Fort Gibson, Indian Territory, as this is the only part of the river to which the appropriation is applicable, where any actual navigation exists at present, and anything beyond which is as yet prospective.

The United States snag boat Wichita, of light draught, and built expressly for this shallow water work, was fitted out during the month of March, and in the early part of April started for her field of operations.

As I had just prior to this time received instructions to make a special report upon the erosive action of the Arkansas River on the bank of Fort Smith, and on the bar formations in the river in front of Van Buren and Dardanelle, Ark., I took passage on board this boat for the purpose of executing them. The report upon these special examinations has appeared House E. Doc. No. 151, Forty-eighth Congress. I extended my examination of the river, however, on up to Fort Gibson, and made a report thereon, which, in addition to giving my views as to the needs, in the nature of aids to navigation, on this reach of the river, detailed the circumstance of a very unfortunate accident which happened to the boat on the 12th of April, before reaching Fort Gibson, and when some 3 miles therefrom. By reason of the injury to the boat from this occurrence, which consisted in the collapsing of one of the flues in the boilers operations were delayed some three weeks. Owing to the situation of the boat, it was with vexatious delay and at considerable extra expense over usual prices that the boat was again in condition for work. However, by the use of the telegraph in communicating with Saint Louis firms the operations were retarded only some twenty five days, and the cost of the repairs as made to the boat in the center of the Indian Territory amounted to some \$150.

After being repaired this boat was soon actively engaged in the removal of snags from the channel of the river, and by the 30th of June had accomplished the following:

Number of snags removed.....	391
Number of trees cut	2,499
Number of drift piles removed	2
.. Number of trees deadened	200

It is thought from the examination of the reach of the river under consideration that, in addition to the removal of the snags from many of the bends, if the amount of commerce to

be benefited justifies the expense, there are some six shoals, viz, Canadian, Webber's Falls, Taylor's Bar, Hildebrand's Bar, Boudenott and Rabbit's Fort, all between the mouths of the Canadian and Grand Rivers, which should be improved by dikes in order to perfect the general improvement of this reach of the Arkansas River.

The accident heretofore mentioned prevented my making a more thorough examination of each of these places; but this is unimportant, since a careful instrumental survey of each of them is necessary to properly estimate the cost of such works as would be required for their improvements, and time and circumstances would not have admitted of this even had I been able to return by boat.

305 As far as my examination was able to show, the shoaling of the river at each of these places seems to be due to the fact that the river spreads out to about twice its usual width for a greater or less distance, depending upon the extent of the shoal, without any increased fall in the water surface. It was with difficulty and some delay, searching for the deepest water at each of these places, that our boat, drawing only 2 feet of water, was enabled to get over them; and, as the water was estimated to have been 2 feet above low water state, it seemed to indicate that a much less depth of water must at other times be encountered. I am, however, informed by the captain and pilot of the boat, both of whom are quite familiar with the navigation of the upper reach of the river, that as the water goes down it concentrates into so much narrower channels as to cause the same or nearly the same depths to be found across these shoals. I am nevertheless of the opinion—in which these gentlemen heartily agree with me—that by running dikes from one bank or the other at each of these places, and contracting the low water channel to about half its present width, much benefit would result to the navigation of this reach of the river. The dikes need not be more than 3 or 4 feet high and 12 to 14 feet wide, and, being constructed of stone and brush, could be built, I think, in that section of the country, for about 10 cents per cubic foot, or say for 24 per linear foot of dike. I estimate roughly, therefore, that the aggregate cost of constructing these dikes at the six places named would amount to some \$40,000.

I have thus far been unable to carry out the plan of making detailed surveys of each of these places, in order to estimate more accurately the cost for their improvement, which received your approval, owing to the fact that I wished to take

a part of the force which is now engaged in the survey of the river above Fort Gibson, with one or both of their quarter boats, in connection with such survey in order to reduce the cost, &c., and that force has not yet completed the work they have in hand.

I will probably be as late as the middle of August before the survey of these places can be made on account of this restriction. The snag boat Wichita is better adapted to the work that is required to be done along the reach of river between Little Rock and Fort Smith than either of the other boats pertaining to the rivers in my charge.

The Reese and Meigs are both rather of too deep a draught for work on the river above here, except on a stage of water that would render their stay somewhat hazardous, owing to the liability of being shut in by a fall of water, so that they could not seek other fields for work. I estimate that the Wichita could be advantageously occupied for eight months on the reach of river between Fort Smith and Little Rock, and that the money available for the work she is now engaged in will be sufficient to place that portion of the river in pretty fair condition, as far as snags are concerned, for a year or two. It appears from the records of this office that the Wichita was engaged during the month of August last in removing snags, &c., from the channel between here and Fort Smith, and it is thought that \$16,000 could be advantageously expended during the fiscal year ending June 30, 1886, by this boat, in the same locality and manner, which, as will be seen under the heading of "snagging operations, Arkansas River, Arkansas", increases the estimate there given by the amount of \$16,000.

The commerce of the Arkansas River above Fort Smith is represented by the carrying capacity of two small boats engaged in the trade there, from the owners of which I have been unable to obtain the figures as to the amounts of freight carried by their boats, although the requests were made some weeks since. It is not thought, however, that this amounts to much as yet, as the reach of river in question lies entirely within the Indian Territory, and the railroads, crossing the river further up, afford a ready and prompt means of reaching a market for what is shipped from there."

306 " 4. Arkansas River between Fort Smith, Arkansas, and Wichita, Kansas. The object of the work under this head is the removal of snags and other obstructions in

the channel, and the cutting of such trees along the banks as are likely to be carried into the river and form obstructions there.

The United States snag boat Wichita was working on this reach of the river after August, 1883, until the winter season made it necessary to discontinue operations, when this boat was taken to Little Rock and laid up for the season. The early part of April found operations again renewed in the same field.

An accident to the boat, however, occasioned some delay and cost for repairs just at the commencement of the present season of work. Repairs were made at reasonable cost and with promptness, considering the location of the accident—in the Indian Territory—and since then, up to the close of the fiscal year, the operations have been satisfactory.

There were 391 shags and 2 drift piles removed and 2,699 trees cut or deadened by this boat during these two short seasons of work. The officer in charge recommends that, in addition to snagging operations on this reach of the river, there should be some dikes constructed, in order to perfect the improvement and effect of deepening of the water over six troublesome shoals between the mouths of the Canadian and Grand rivers. It is estimated approximately that the entire cost of the improvement of these places will not exceed \$40,000. At the same time a special survey of each locality, with a view to their improvement in the manner stated, is necessary in order to arrive at a more accurate estimate of cost.

10. Continuation of the survey of the Arkansas River from Wichita, Kansas, to Fort Gibson, Indian Territory. A survey party commenced work in the field at Wichita, Kans., the latter part of March, where the necessary outfit had been provided, and to date have worked over all that portion of the river between there and a point somewhere in the vicinity of Tulsa, Ind. T.

It is expected that the party will have reached Tulsa by the 10th of July, and that the entire work assigned them will be completed by the early part of August.

The boats for the survey were constructed at the uppermost point of the survey during the month of March. The party for conducting the actual work in the field was assembled there by the latter part of that month, since which time the work has been progressing satisfactorily, having reached a point opposite Pawnee Agency, Indian Territory,

on the 9th of June. It is thought that by the 10th of July the survey will have reached Tulsa, Indian Territory. Gauges have been established at Wichita and Arkansas City, Kans. and at a point near Muskogee, Indian Territory to indicate the changing conditions of the river during the progress of the field work."

(Plaintiff's Exhibit 37.)

307 (House Executive Document, No. 90, 49th Congress,
First Session.)

308 49th Congress, House of Representatives. Ex. Doc.
1st Session No. 90.

Survey of Arkansas River From Fort Gibson to Wichita, Kans.

Letter

From

The Secretary of War,

Transmitting

A report from the Chief of Engineers of an examination and survey by Capt. H. S. Taber, Corps of Engineers, of Arkansas River from Fort Gibson to Wichita, Kans.

February 26, 1886—Referred to the Committee on Rivers and Harbors and ordered to be printed.

War Department,

Washington City, February 23, 1886.

The Secretary of War has the honor to transmit to the House of Representatives a letter of the 18th instant from the Chief of Engineers, and the accompanying copy of a report from Capt. Henry S. Taber, Corps of Engineers, of the results of a survey of Arkansas River from Fort Gibson to Wichita, Kans., made under his direction to comply with a provision

of the river and harbor act of August 2, 1882, which makes special appropriation therefor.

WM. C. ENDICOTT,
Secretary of War.

The Speaker of the House of Representatives.

Office of the Chief of Engineers.
United States Army,
Washington, D. C., February 18, 1886.

Sir: I have the honor to submit herewith a copy of a report received at this office from Capt. H. S. Taber, Corps of Engineers, of the results of a survey of Arkansas River from Fort Gibson to Wichita, Kans., made under his direction to comply with a provision of the river and harbor act of August 2, 1882, which makes special appropriation therefor.

Captain Taber reports that the difficulties to be overcome to make navigation possible between Wichita and Arkansas City, the last town on the river in Kansas, 71 miles below, are such as would require an outlay for its improvement altogether out of proportion to the present or near prospective demand of commerce, and for that reason he submits no plan for the improvement of this part of the river. Fifteen miles below Arkansas City the river enters the Indian Territory, where, there being no local traffic along the banks for about 150 miles, as far as the Cimarron, its improvement would at present be valuable only as a connection of the lower part of the river with the southern part of Kansas, whose trade now centers at Arkansas City. From the mouth of Cimarron down to Fort Gibson, 82 miles, the Indian country is cultivated to a considerable extent, and the local traffic derived therefrom would be of same importance. The cost of a low-water improvement is placed by the officer in charge at \$1,670,000.

In his opinion much relief would be given to navigation at high and medium stages of the river between Fort Gibson and Arkansas City by an expenditure of about \$20,000 for the removal of snags, bowlers, and ledges, and building dikes to contract the water-way over a few shoals. This would greatly benefit the prosperous and rapidly developing region along the southern tier of counties of Kansas by furnishing an outlet to market. A statement of the products of

that region for the years 1883 and 1884 is given in the report.

Very respectfully, your obedient servant,

JOHN NEWTON,
Brig, and Bvt Maj. Gen.,
Chief of Engineers,

Hon. Wm. C. Endicott,
Secretary of War.
Survey of Arkansas River from Wichita, Kansas, to Fort Gibson, Indian Territory.

United States Engineer Officer,
Little Rock, Ark., January 23, 1886.

General: In my annual report for the year ending June 30, 1885, under the head of Survey of the Arkansas River from Wichita, Kans., to Fort Gibson, Indian Territory, I stated that, for reasons there set forth, final report could not be submitted at that time, but it was expected would be ready in time for the present session of Congress.

I have the honor to transmit such report, with accompanying tracing; the object of this survey, together with the methods pursued in making it, have been already sufficiently elaborated in my annual report for the year ending June 30, 1885. Inviting attention, therefore, to the assistant's report, appended and marked A, I proceed to the question of the improvement of this reach.

After a careful study of all the data furnished by the survey including carefully plotted notes of the soundings, the reach of river from Wichita, Kans., to Arkansas City is found carry so little water, and to have so great a slope, as to require for its improvement an outlay so altogether out of proportion to the present or near prospective demands of commerce, that it seems but a waste of time to prepare any plans or make any recommendations for its improvement.

There is no doubt but that a 2-foot channel can be provided whenever the development of the country warrants it; and the river should be, for all purposes of law, rated as navigable to Wichita, Kans.

Beginning at Arkansas City, the river may be rated
310 with a large number of rivers now undergoing improvement for the use of light-draught boats, with this exception, that there is now engaged in traffic on this reach a peculiar steel steamer with a fleet of steel barges

that draw not to exceed 12 inches of water. This is regarded as a factor which not only simplifies the problem of improvement, but warrants immediate and careful attention, in view of the benefits immediately to accrue. At the proper place this boat will be again referred to.

It seems scarcely necessary to enter upon a detailed description of the reach of river from Arkansas City to Fort Gibson, inasmuch as at this time so many similar rivers have been improved that when it is stated that the river is obstructed by gravel and sand bars, with the usual quota of snags, due to caving banks, and that its waters in many places are spread over wide shoal places, or split into several channels by islands, the entire river presents itself as a familiar picture.

It will therefore be sufficient to refer any one wishing these details to Mr. Burrow's report, which is appended, with the remark that the personal attention necessarily given the preparation of the accompanying tracing leads me to believe that his report is based upon well determined facts as found and then pass to the question of improvement.

This question has its general and special answers. In the first place this reach can be permanently improved without respect to the lower reaches, so far as engineering requirements are concerned, though its usefulness will only be fully developed when the river has been fully improved from its mouth to Fort Gibson. In the next place the interests of navigation may be materially benefited either by laying out a complete scheme for its permanent improvement and adhering to it as a whole, with large appropriations, or by providing for improving the navigation at medium stages of water, and providing that all expenditures for this purpose shall be strictly in accord with the general plan for the permanent improvement.

1. Permanent Improvement.

The words "permanent improvement," as used here, are used as applying to a series of works so constructed as to give permanent relief to navigation within certain limits. It is necessary to state this, in order that it may not appear that provision is made for relief to navigation, in the sense of making an exhaustive use of all water available, giving the deepest low water channel possible. No such provision as this could be made upon data from a river survey, costing little over \$30 per mile. To cover the entire distance (309 miles) by a survey with the amount allotted, \$9,081.50, rendered it necessary to omit the outlining of bars and islands and

important shoals with that completeness absolutely necessary for the determination accurately what shall be done to give the maximum depth and width of channel at a minimum cost. The plans and estimates, therefore, submitted here are solely for such permanent improvements as shall insure a 2-foot channel at low water, say from 200 to 800 feet wide, as high as Arkansas City.

To accomplish this it is proposed to place wing-dams upon all the shoals requiring deepening, and to protect caving banks by the judicious use of dikes, and to use in cases where necessary hurdle-dikes at right angles to the current to cause deposits and also parallel to the channel, if necessary, to contract the water at medium and low stages.

In several instances rocks and bowlders will have to be removed, and at first, until the caving is stopped, a snag boat will have to be employed to remove dangerous snags. This
311 latter will be a temporary service, however, as after the first season, whenever the work is completed, no more snags should appear.

As this boat will be first required, provision will be made for it first. It should be built at a minimum cost and be run by a crew at minimum expense, inasmuch as it will not be long required.

I would therefore recommend that a strong-built, hand-propelled snag boat be built, in all respects similar to the one that has operated so successfully the past season upon the Saint Francis River. Such a boat can be built at Little Rock at an expense not to exceed \$4,000, and can be run it an expense not to exceed, all told, \$900 per month, and will have a capacity for work equal to a steam-propelled snagboat costing \$15,000, and run at an expense of \$2,000 per month. As rapid transfer from point to point is no object, such an outfit will answer every purpose for this reach.

To contract the water over certain shoals where a deposit cannot well be secured, and where piling cannot be used, brush and stone dams will have to be constructed. It is estimated that there will be required 30,000 linear feet of such dams, which, at \$6 per linear foot, will require \$180,000.

To contract the water upon shoals where deposits may be secured, to protect caving banks, and to provide dikes parallel to the current (or primary hurdles) it is estimated that 296,500 linear feet of dikes will be required, which, at \$5 per linear foot, will require \$1,482,500.

In the upper portion of the reach in question there are certain rock shoals that will have to be excavated. It is estimated that 10,000 cubic yards of rock will require removal, which at \$2.50 per cubic yard, will require \$25,000, or, briefly:

One hand-propelled snag-boat	\$4,000
Six months' running expenses of same	5,400
30,000 linear feet brush and stone dike, at \$6	180,000
296,500 linear feet brush and stone dike, at \$5	1,482,500
Excavation of 10,000 cubic yards rock at \$2.50	25,000
Total	1,696,900

Amount hitherto expended on this reach
 Amount that can be profitably expended in one season 250,000

Of this last amount the \$4,000 for the construction of the snag-boat is a prime requisite.

II. Improvement to Meet The Requirements of Navigation at High and Medium Stages of Water.

While it is recommended that the improvement as set forth above be entered upon at the outset, nevertheless, if it is not believed that such an expenditure is warranted, much relief can be given navigation by the removal of snags, bowlders, a few ledges, and by building a few dikes to contract the water over the worst shoals. With this object in view, the following sums will be required, viz:

One hand-propelled snag-boat	\$4,000
Running expenses of same, six months	5,400
For dikes, removing bowlders and ledges	10,000
Contingencies	600
Total	20,000

Attention is invited to the remark in the earlier part of this report that if this last method is resorted to it should be expressly provided that if this last method is resorted
 312 to it should be expressly provided that so far as may be practicable the projects for improvement shall be so drawn as to be in keeping with the general plan of permanent improvement outlined herein.

Commerce.

The improvement of this reach will principally benefit the southern tier of counties in Kansas, a very prosperous, fertile section, and one rapidly developing.

Below is a tabulated statement of the products of the country within a radius of 50 miles of Arkansas City, Kans., taken from the mouth of the Arkansas River to Fort Smith, on the Agriculture, for the years of 1883 and 1884:

County.	Wheat.	Corn.	Value of animals slaughtered.	Total value of crops of all kinds.
	Bushels.	Bushels.		
Butler.....	743,340	4,448,220	\$632,433	\$2,175,859 41
Chautauqua.....	53,320	1,697,820	764,576	1,031,908 30
Cowley.....	1,141,660	3,721,641	605,606	2,437,270 81
Elk.....	96,852	2,502,381	347,665	1,173,263 96
Harper.....	369,540	1,542,324	70,909	1,043,643 57
Kingman.....	467,080	1,270,360	64,871	744,832 77
Sedgwick.....	1,735,646	4,928,866	774,458	2,663,702 65
Sumner.....	1,513,850	4,796,606	1,077,739	2,431,000 04
Total.....	6,121,288	24,907,918	4,338,257	13,701,481 51

This report further shows that there was, March 1, 1883, and March 1, 1884, old corn on hand in the various counties for which there appears to have been no outlet. Amounts as follows:

Counties.	1883.	1884.
	Bushels.	Bushels.
Butler.....	546,302	1,238,110
Chautauqua.....	319,567	423,488
Cowley.....	743,237	1,200,641
Elk.....	285,497	380,854
Harper.....	131,285	217,672
Kingman.....	67,622	150,205
Sedgwick.....	747,738	1,196,480
Sumner.....	714,641	1,300,981

There is little doubt but that this crop would all be called for if there was a cheap freight outlet to the south. The fact that the railroad company that operates a line of railroad from the mouth of the Arkansas River to Fort Smith, on the same river, is making strenuous efforts to extend its line to tap this commerce is practical proof of the need of an outlet.

Before closing this report special attention is invited to the two bridges mentioned in Mr. Burrow's report. These bridges should have drawspans placed in them by the companies operating them, under the directions of competent authority.

They were not included in my report of last February relative to bridges over navigable waters, as at that time it was an open question whether any improvements would be recommended.

The arrival of the steel steamer and its complement of five barges made a radical change in the conditions of the
313 problem of improvement.

The following clipping from the Saint Louis Globe-Democrat will give a good idea of the craft and its objects: It has been successfully, operated on the river since some time in July, and opens a very interesting condition of affairs. Any improvement of this reach of river will be immediately beneficial and add greatly to the material prosperity of Southern Kansas through the enterprise of the owners of this boat.

A Steamer For Shallow Water.

Yesterday morning a small tow-boat, intended for the upper waters of the Arkansas River, left this port for her destination, Arkansas City, Kans. The distance she will have to travel before arriving there is over 1,400 miles. The boat was built at Carondelet by Allen & Blaisdele, is 75 feet long, 15 feet beam, and 3 feet hold. The hull is built entirely of the best boiler steel, is provided with engines of the stern-wheel type, 8 inches diameter by 42 inches stroke, with boiler of fifty horse-power. She draws only 12 inches of water, and is designed to go under a bridge with only 12 feet clearance.

Attempts have been made heretofore to navigate the shallow waters of our upper rivers and smaller streams, but this is the first boat built, with abundant capital at hand, to develop the navigation in a proper manner.

The steel barges are built expressly for the grain trade, though of course may be used for other freight occasionally.

H. S. TABER,
Captain of Engineers.

Brig. Gen. John Newton,
Chief of Engineers, U. S. A.

Report of Mr. F. S. Burrows, Assistant Engineer**United States Engineer Office,****Little Rock, Ark., November 6, 1884.**

Captain: I have the honor to submit the following report upon a survey of the Arkansas River between Wichita, Kans., and the mouth of Grand River, Indian Territory. The survey was initiated in March, 1884, under the orders of your predecessor, Maj. M. B. Adams, and completed under your direction in July.

Method of Making Survey.

The general mode of procedure for the survey, as outlined in a letter of Major Adams to the Chief of Engineers, dated January 11, 1884, is as follows: Two small boats, 36 feet by 14 feet each, to be built at Wichita, for the purpose of quartering the party and transporting supplies and property, all instruments, supplies, skiffs, and other property to be collected there, and the survey to proceed thence down-stream. A line was to be measured down one bank, and points on opposite side located by angular intersection, observations for meridian on Polaris being taken at intervals as a check on the transit line. Topography was to be filled in on both banks for a short distance back, and a single line of levels was to accompany the survey, showing the elevation of the water at each half mile. Soundings were to be taken between points, designated by the shore parties, by the recorder, who also noted the character of the bottom and all obstructions, both natural and artificial. Discharge observations were to be taken below the mouths of the Salt Fork, Cimarron, and Grand rivers.

This plan was carried out without any material change. The boats were reduced in width from 14 to 12 feet on account of pile bridges across the stream, which would not allow the passage of a boat 14 feet wide.

Meandering transit lines were run down either bank, the measurement of one being done with the chain and the other by means of the stadia. Connecting points as well as sounding ranges were located by intersection. Discharge observations were taken at the points indicated as well as at three other places. The parties in the field were directed as follows: F. S. Burrows, in charge of stadia line, down right bank: F. P. Spaulding, in charge of chain line, down left bank:

E. B. Adams in charge of line of levels, and M. A. Orlopp, Jr., recorder, in charge of sounding skiff.

314 Games to show oscillation of the river were established at Wichita, Arkansas City, (both above and below the dam), and at the railroad bridge, 2 miles above the mouth of Grand River, and daily readings taken thereon during most of the time the survey was in progress. A record of the daily change was also kept along with survey. Much more valuable data would have been supplied had there been at least two other gauges kept, one at the mouth of the Salt Fork and the other at the mouth of the Cimarron River. The gauges at Arkansas City and above the mouth of Grand River were too far apart to give a correct idea of the stage of water at the mouths of these two tributaries, both being at a medium flood stage when the survey was made. The method of quartering and transporting the party was found to be in every way satisfactory after passing Arkansas City, but above that point, a distance of 65 miles, the river was found to be so shallow and full of bars as to make the moving of the boats consume more time than the actual work on the survey. In several instances the party had to be withdrawn from the line for a day at a time in order to get the boats over shoals, and this in spite of the fact that they were only drawing some 6 or 7 inches of water.

General Description of the Country.

The portion of the river surveyed flows in a general southeasterly direction, the upper part for a distance of 70 miles passing through Southern Kansas and the balance nearly across the northeastern quarter of the Indian Territory.

From Wichita to Arkansas City, a distance of 65 miles, the river flows through a rich undulating prairie country almost entirely devoid of timber, except a slight fringe of cotton-wood and willow along the water courses. It is thickly settled and highly cultivated, producing generously all the cereals, mostly corn and wheat.

A few miles below Arkansas City, and in the vicinity of the line between Kansas and Indian Territory, the character of the adjacent country changes rapidly, becoming much more rugged and better timbered. Rocky ridges from 50 to 100 feet in height follow the course of the stream more or less closely for the balance of the distance, the river at many points impinging directly against them. These ridges are partially covered with a growth of timber, which is in the upper part of

the Territory consist of scattering jack-oaks, but which gradually increase in density, quality and extend as the river is descended, elm, ash, gum, hickory, and early all the varieties of oak being found.

Immediately along the banks and on the bars and islands a growth of cotton-wood and willow is found throughout the entire distance. A short distance below the mouth of the Salt Fork black walnut begins to make its appearance, and gradually increases in quantity, until from about the mouth of Black Bear Creek to the mouth of Cimarron River it occurs in quantities large for so valuable a timber. Below this point, although the natural stand of walnut does not decrease, the better portion of it in close proximity to the river has been cut and rafted out. The country some distance back from the river, as well as much of the bottom land adjacent, remains almost timberless prairie throughout the entire distance. Limestone appears in a number of places along the bed and banks in Kansas and the upper part of the Territory, but the rock showing on the ridges in the Territory is a sandstone. As the mouth of Grand River is approached, slate and coal outcrop makes its appearance along the banks of the river. This coal is worked to a sufficient extent to partially supply the home demand with fuel. It is said to be of a very fair quality.

Towns and Settlements.

Wichita, Kans., the initial point of the survey, is a thriving city of 25,000 inhabitants. It is the county seat and principal trading point for Sedgwick County, one of the richest counties in the State. It has four railroads and numerous mills and elevators for handling the immense quantities of grain for which it is the shipping point.

Derby, the next settlement as we go down the river is a small town on the left bank, the Arkansas City branch of Atchison, Topeka and Santa Fe Railroad passing through it. It contains some 300 or 400 inhabitants, and is the shipping point for a considerable section of rich agricultural country.

Mulvane, also on the left bank and on the same railroad, is the next town. It is a little larger and answers just the same purpose as Derby—that is, ships the products for quite a large and fertile section.

Oxford, on the right bank, is the next town below Mulvane, and is on the Kansas City, Lawrence and Southern Kansas

Railroad, which crosses the river at this point. Although but a village of some 700 or 800 inhabitants, large quantities of grain are brought and shipped here and the necessary supplies sold to the farmers.

About 15 miles below Oxford and $1\frac{1}{2}$ miles back from the right bank of the river is Salt City or Genda Springs. This is a small place, intended as a resort for invalids. Certain springs in the vicinity said to have medicinal and health-giving properties constitute its claims to favor.

Arkansas City is the last town on the river in Kansas, Although not large, containing only some 5,000 or 6,000 inhabitants, it is a thriving and rapidly growing place. It has five large flouring mills, which consume all the wheat raised in the vicinity, and ship flour to all parts of the country. These mills are run by water-power obtained by placing a dam across the Arkansas River at the upper end of the town. The water is then carried by means of a canal around the lower end of the town, and after the power of its fall is utilized is finally wasted into Walnut Creek, which empties into the Arkansas some distance below. Arkansas City is the terminus of the branch railroad from Wichita of the Arkansas, Topeka and Santa Fe Railroad, and is the main supply point for the Indian agencies and cattle ranches in the northern part of the Indian Territory.

Fifteen miles below Arkansas City we enter the Indian Territory where, as the land is at present held in reserve by the General Government for the use and benefit of the Indians, there are, of course, no large towns or villages. The agencies are about the only settlements of any size in the northern part of the Territory. Kaw Agency is situated on Beaver Creek, $1\frac{1}{2}$ miles back from the left bank of the Arkansas; Ponea Agency, on the Salt Fork, 2 miles back from the right bank, and Pawnee Agency, on Black Bear Creek, 6 miles back from the Arkansas. These are nothing but Governmental supply points and trading posts for the Indians.

Seventeen miles below the mouth of the Cimarron River, where a branch of the Saint Louis and San Francisco Railroad crosses the river, and about a mile back from the left bank of the river, is Tulsa, a small trading point containing several stores, church, school, &c.

Twenty miles further down the River is We ata-ka, where a large mission school supported by the Presbyterian Church has been established.

Muskogee, one of the largest towns in the Territory, is in the Creek Reservation, on the Missouri, Kansas and Texas Railroad, and about 3 miles south of the river. Fort Gibson, a Government military post, and which has become an important trading point, is situated on the left bank of the Grand River, $2\frac{1}{2}$ miles above its mouth.

Much of the land in the Indian Territory on and near the river is rich, rolling, prairie, more or less timbered, and would no doubt yield liberal returns to cultivation. The ridges also afford excellent pasturage. Its resources as an agricultural country have not, however, been developed to any considerable extent. Especially is this true of that portion of the Territory from the northern line to the mouth of the Cimarron River, which, being held by the Kaw, Ponca, Oto, Osage, and Pawnee Indians, tribes which have as yet failed to largely change their native habits for those of an agricultural people, is used only as a hunting ground, or let in large lots for small rental for grazing purposes. Below the mouth of the Cimarron we find the Creeks and Cherokees, tribes which having, either from greater length of time, natural inclination, or admixture with the whites, taken more kindly to agricultural pursuits, are found making intelligent and successful efforts to till at least a portion of their vast domain.

The River.

In the discussion of the river with reference to its general hydrographic features—that is, depth, oscillation, character of bed and banks, obstructions, both natural and artificial, and the general feasibility, desirability and probable cost of making successful navigation possible throughout the whole or a part of the river embraced in the survey—it should be borne in mind that no portion of it is at present or has ever been considered the head of the navigation, although, in fact, the commerce of the river for 40 miles below this point is practically nil.

It is true that on one occasion a small boat made the trip from Little Rock to Arkansas City, Kans., and return, but it was of no practical benefit as demonstrating the navigability of the stream. The boat was of very light draught, made the run on the crest of one of the short rises in June and July, and carried no freight of consequence either way.

Tributaries.

The principal tributaries beginning at Wichita are Little Arkansas River, Ne Ne Sciah, Slate, Walnut, Grouse, Chaloc-

ca, and Beaver Creeks. The Salt Fork, Red Rock, Salt Rock, Black River and Bear creeks, Red Fork or Cimarron River, Caney Creek, Verdigris River and Grand River. In giving a detailed description of the river it will be more convenient and satisfactory to take it up in the four parts into which it is naturally by its main tributaries, viz, Walnut Creek, the Salt Fork and Cimarron River.

316 The following table shows distances, width, and slope of the river, as well as the location of towns and mouths of tributaries:

Dis- tance.	Widths.		Eleva- tions of water surface.	Difference in elevation.	Slope feet per mile.	
	Low water.	High water.				
Miles.	Feet.	Feet.	Feet.	Feet.		
0	600	750	995.1	.....	.....	Mouth of Little Arkansas River, Wichita, Kans.
6	650	900	969.4	25.7	4.283	Chisholm Creek.
15½	500	700	936.1	33.3	3.505	Derby.
22	300	400	911.8	24.3	3.738	Mulvane.
34	500	600	867.8	44.0	3.666	Cowskin Creek.
37½	500	550	854.9	12.9	3.686	Ne Ne Seah Creek.
38	550	650	853.8	1.1	2.200	Dam.
42	350	750	842.1	11.7	2.925	Oxford.
56	500	600	804.6	37.5	2.679	Slate Creek.
60	600	650	796.2	8.4	2.100	Salt City Ferry.
65	900	950	787.2	9.0	1.800	Arkansas city, above dam.
.....	.....	.....	781.6	14.6	2.920	Arkansas City, below dam.
67	500	550	776.1	5.5	2.750	Arkansas City, lower bridge
71½	850	950	763.6	12.5	2.778	Walnut Creek.
77½	350	1,200	748.1	15.5	2.583	State Line.
81	500	700	740.0	8.1	2.314	Chalocca Creek.
89½	600	950	721.3	18.7	2.200	
96½	500	650	703.5	17.8	2.544	
102	500	700	688.5	15.0	2.727	Kaw Agency.
113	700	1,200	660.8	27.7	2.518	
129	600	1,400	617.0	43.8	2.737	Salt Fork.
143	1,050	1,100	580.1	36.9	2.636	
152	850	950	559.9	20.2	2.244	Red Rock Creek.
158	900	1,000	544.3	15.6	2,600	
164	1,600	1,700	527.0	17.3	2.883	
171½	850	1,250	511.0	16.0	2.133	Salt Creek.
178	1,000	1,200	493.0	18.0	2,769	Pawnee Agency.
184	900	975	479.8	13.2	2.200	Black Bear Creek.
200	950	1,200	439.0	40.8	2.550	
216	1,025	1,100	405.3	33.7	2.106	Bear Creek.
227	1,100	1,400	382.7	22.6	2.055	Cimarron River.
244	1,150	1,300	345.6	37.1	2.182	Saint Louis and San Fran- cisco Railroad bridge.
255	1,000	1,800	322.1	23.5	2.136	
263	800	1,000	304.6	17.5	2.187	We-a-la-ka.
272	1,400	1,600	287.0	17.6	1.955	
278	1,200	1,800	275.9	11.1	1.850	Atkin Ferry.
289	900	1,850	252.4	23.5	2.136	Bar's Mill.
290	.....	.....	.....	.....	.....	Caney Creek.
298	1,300	1,500	234.5	17.9	1,987	
307	700	850	212.7	21.8	2.422	Missouri, Kansas and Texas Railroad bridge.
308	.....	.....	.....	.....	.....	Verdigris River.
309	800	1,700	206.9	5.8	2.900	Grand River.

Wichita to Mouth of Walnut Creek.

The water during the survey of this portion was at a very advantageous stage, being near its lowest point most of the time, thus exposing the obstacles to its improvement. The length of this reach is $7\frac{1}{2}$ miles. The width varies from 300 feet to 1,200 feet, the general width between main banks being 600 feet or 700 feet. The general course of the stream is not tortuous, but the line of deepest water is very winding, frequently crossing the river three or four times within a mile. A channel 1 foot in depth was found most of the way, but it is so narrow and crooked as to be of no practical utility for navigation even in a skiff. At a number of places the greatest available depth found was from 3 to 6 inches. Our own experience in moving our small quarter boats is a practical demonstration of the condition of this portion of the river during low water. In many instances it was only by means of the combined power of the whole party applied to poles and purchase blocks that they were worked over shoal places.

The bed and banks are composed almost entirely of sand, the banks varying in height from 6 to 15 feet, the general height being about 8 or 9 feet. The velocity of the current is from 2 to $2\frac{1}{2}$ miles an hour.

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Obstructions.

Besides the numerous sand-bars, which are the principal obstructions, rocks occur in several places, first appearing in the bed of the stream one-half mile above the bridge at Derby. As might be expected in such an almost timberless country, the snags are small and few in number. Besides these natural obstacles there are five bridges in which draws should be placed, and two dams to be removed, located as follows: Road bridge at Derby, built on pile bents; road bridge at Mulvane, on pile bents; railroad bridge at Mulvane, on pile bents; iron railroad bridge at Oxford, set on masonry; road bridge at upper end of Arkansas City, built on pile bents; road bridge at lower end of Arkansas City, built of wooden trusses set on pile piers. There is also a ponton bridge for vehicles at Oxford, which could of course be removed without much expense, but I was informed at the time of survey that a fixed iron bridge set on masonry was under contract to be constructed during the summer. These include all the bridges below Wichita and above Walnut Creek. There are three bridges crossing at Wichita, but, as the proposed head of navigation could be at the lower end of the town, they need not be considered.

A dam, located 4 miles above Oxford, yields the power to run a flouring mill. It is a dilapidated structure, built of brush and stone, over which the water has a fall of 1.4 feet. Besides being an obstacle to navigation, which would require considerable expense to remove, its removal would cause dissatisfaction on account of the destruction of the useful power derived from it.

The dam at Arkansas City is a more substantial structure, of stone and brush, the water over it having a sheer fall of 5.6 feet. While perhaps the right to the power derived from this dam may never have been legally acquired, yet its destruction would cause great dissatisfaction and large pecuniary loss.

Oscillation and Floods.

The extreme oscillation of the river at Wichita during the past spring and summer was 5 feet, the lowest water occurring in April and the highest in July. The oscillation at Arkansas City below the dam, during the same time, was 6 feet. At both these places the water reaches a point from 2 to 3 feet higher during exceptional years. The flood season begins generally in the latter part of May or early in June, and continues for about six weeks or two months, the water for the balance of the year being at a very low stage—lowest water occurring generally in midwinter.

Question of Improvement.

Any scheme for making this portion of the river navigable would necessarily include some plan of improvement which would make navigation practicable at a very low stage, as the floods are of such short duration and so uncertain as to date of arrival that neither shippers nor steamboat owners could depend upon them. In order to so improve the river, all of the water would have to be confined to a channel not more than 200 feet in width which would yield an available depth of 2 feet.

In order to do this, wing-dams and training-dikes would have to be built throughout almost the entire length. The expense of constructing such works can hardly be estimated from the cost of similar structures elsewhere on account of the lack of raw material easily obtainable. The growth of willow is small and entirely insufficient in quantity for the work in hand. As to large timber, the supply is very limited, of poor quality, and valued so highly in this, almost timberless, country, that in order to secure it, exorbitant prices would

have to be paid. Although, as before stated, the country through which this portion of the river passes is thickly settled and highly cultivated, yet, on account of the difficulties to be overcome and tremendous expense which would be incurred in making navigation possible, it is very doubtful if the value of the commerce would ever bear any reasonable relation to the cost of the improvement.

The citizens have long since recognized the impracticability of ever making this part of the river an artery of trade, and have therefore not hesitated to obstruct it with bridges and dams. The railroads built and projected will easily solve the problem of transportation without the river being considered as a factor. It should be borne in mind that in order to make this improvement available for traffic to any extent would presuppose the opening of the 250 miles of river below Walnut Creek and lying wholly within the at present almost entirely unproductive Indian Territory, as the shipment of through freight, such as grain and flour, down, and lumber and perhaps some cotton up, stream, would constitute the entire paying traffic.

Walnut Creek to Mouth of Salt Fork.

The river rose just after we left Arkansas City, and remained from 2 to 5 feet above low water during the balance of the survey. This was the more to be regretted
318 as the information obtainable from the inhabitants along the banks in reference to the characteristics of the river at its lowest stages was at all times meager and unsatisfactory.

The length of this reach is $57\frac{1}{2}$ miles. The general width from bank to bank is 1,000 feet, varying from 600 to 2,000 feet. The average height of the banks is from 10 to 12 feet.

Character of Bed and Banks and Obstructions.

The bed and banks are generally of sand, but coarse gravel makes its appearance in many places, no doubt offering resistance to the scouring action of the water, utilized in a plan of improvement by concentration, so far as to necessitate other aid in its removal. At points where the river impinges directly against the ridges the banks and a portion of the bed is of rock, which in a few instances would require removal in order to give an available depth of water. In the majority of cases, however, there is at present a sufficient depth of water over the rock. From the mouth of the Salt Fork, for a distance of 25 miles up stream, the river is cut into numerous channels by large and heavily-timbered islands. As was to

be expected, this division of the water was found to make the available depth in any one of the channels very small.

As in the upper reach, sand and gravel bars are the principal obstructions, the banks being more heavily timbered and caving more rapidly. The snags are larger and much more numerous.

Tributaries.

The only tributaries of importance in this reach are Walnut and Grouse creeks, streams 150 feet in width, and which at times discharge large volumes of water into the Arkansas. Their floods, however, are of short duration and as they occur almost simultaneously with those in the river serve only to add to the height and slightly to the duration of the floods below their mouth. There are a number of other smaller tributaries, but being mostly short creeks their floods are more in the nature of freshets and run out so quickly as to be of little practical benefit to navigation.

Improvement and Commerce.

To improve this portion and give an available depth of 2 feet the low-water channel should be reduced to a width of not more than 300 feet. The material for doing this work could be found most of the way immediately along the bank. There is no commerce along this reach and its improvement would at present be valuable only as a part of a plan to make the whole lower part of the river navigable so as to tap the productive southern parts of Kansas.

Salt Fork to Cimarron River.

The length of this reach is 98 miles, the general width 1,100 feet, varying from 600 feet to 2,500 feet. The general height of the banks is from 15 to 20 feet. The character of this part of the river differs from that above in the following particulars: Clay makes its appearance in the banks, and the gravel becomes coarser and of more frequent occurrence on the bars and in the bed of the stream.

Tributaries.

The Salt Fork is the principal tributary to this reach; it is 400 feet wide at its mouth, and at the time of the survey was just receding from a medium flood stage and was discharging a large volume of water. The water was heavily charged with a red clay, of which its banks are mainly composed, and is of a slightly brackish taste, which peculiarity gives it its name. There are three other important tributaries, viz, Red Rock,

Salt, and Black bear creeks, which swell the volume of water. Red Rock and Black Bear creeks enter the right bank, are each 200 feet in width, their waters being charged with red clay and slightly brackish in taste, a distinguishing characteristic of most of the large streams entering from the right below the Salt Fork.

The Salt Fork enters the left bank, is 150 feet wide at its mouth, and is a long and important tributary.

Floods.

The floods on this portion rise much higher and continue much longer than on the river above. By removing the larger snags and some rocks this reach of river could be made navigable for at least three months in the year; that is, 319 from about May to July, inclusive. There is also usually a slight rise in the early spring. The low-water season, as in the rest of the river, occurs during the fall and winter, at which time the water reaches a stage which would not allow of navigation of any sort with the river in its present state. A good illustration of the difficulty of navigating this portion of the river was furnished by the snag-boat Wichita. In the fall of 1881 this boat made a trip up the river and reached a point opposite the Pawnee Agency. By this time the water had fallen to near its lowest stage, and the boat was held at or near this point for four months in spite of the fact that it was only drawing some 14 inches of water, and was furnished with good appliances for dragging over shoal places.

Obstructions.

Snags and rock heaps, together with sand and gravel bars and reefs and some rock, constitute the obstructions to navigation in this reach of the river. There are no bridges, dams, or other artificial obstacles.

Improvement.

In order to improve this portion of the river so as to make navigation practicable at low water, the channel should be contracted to a width of not more than 350 or 400 feet by means of dams, closing chutes, and by training dikes along the wide reaches. This would also necessitate the revetment of caving banks in many places in order to retain the channel within the lines laid down. These structures need not be carried to a greater height than 5 or 6 feet above low water. Most of the material needed for the work could be obtained immediately along the banks. Allowance should also be made

for the employment of a small snag-boat during three or four months each year.

Commerce.

As in the reach above, there is no local traffic on this portion of the river, and its improvement would at present only be valuable as part of a plan to make the whole of the river through the Indian Territory navigable.

Cimarron River to Grand River.

The length of this reach is 82 miles. The width between banks varies from 700 to 3,000 feet, the general width being about 1,200 feet. The low-water width varies from 500 to 1,500 feet. The general height of the banks is 20 feet.

Tributaries.

The Cimarron or Red Fork, entering at the head of this reach, is 800 feet wide, and is a long and very important tributary, adding largely to the volume of water in the Arkansas below its mouth. At the time of the survey it was at a medium flood stage, its waters holding in suspension large quantities of red clay, and were of so brackish a taste as to be extremely unpalatable for drinking purposes. The other tributaries are mostly small creeks, which, taken collectively, add considerably to the volume of water in the river. None of them, however, are of individual importance, except the Vedigris River, which enters the left bank one mile above the mouth of Grand River. This river is 350 feet wide at its mouth, and is a tributary of great importance to the river below, but entering, as it does, so short a distance above the Grand River, it does not affect to any appreciable extent the question of improvement above that point.

Obstructions.

The usual sand-bars, rock and gravel reefs, snags and drift-piles are found in this reach, the gravel reefs and snags being especially noticeable. Besides these natural obstructions, two railroad bridges cross the river. A branch of Saint Louis and San Francisco Railroad crosses at Tulsa, 17 miles below the mouth of the Cimarron. This bridge is a wooden structure set on piles. The main line of the Missouri, Kansas and Texas Railroad crosses 2 miles above the mouth of Grand River on a handsome truss-bridge built of wood and iron, and set on masonry piers. Neither bridge is supplied with a draw, although the lower one is sufficiently high to allow the passage of small boats at medium stage of water by lowering the chimneys. Both, however, should be supplied with draw-spans

should the question of improvements be decided upon favorably.

320 Floods and Other Characteristics.

Receiving as it does the benefit of all the large tributaries above (the Cimarron River especially) this reach of river in its availability for purposes of navigation is found to be a great improvement on the river above. The floods have a greater oscillation, are of longer duration, and are more to be depended upon than above. The oscillation at the railroad bridge above the mouth of Grand River during the past spring and summer—that is, from April to September—was 15 feet, the lowest stage occurring in April and the highest on May 3. During most years small boats could navigate this reach for a period of three or four months, beginning in May, if the snags were removed.

The banks are of sand and clay, very coarse gravel appearing in large quantities on the bars and in the bed of the stream. Slate rock and coal outcrop appears in the right bank towards the lower end of the reach.

Improvement.

In order to improve this part of the river for low-water navigation works of similar nature to those spoken of in connection with the river above would be required; that is, by means of dams and dikes. The side chutes should be closed and the general width reduced to 400 or 500 feet. A snag-boat should also be employed during a part of each year.

Commerce.

As the country along this reach of river is cultivated to a considerable extent, the local traffic derived therefrom would be of some importance, and could, no doubt, in a short time, be built up to equal that along the river between Fort Gibson and Fort Smith.

The Map.

The map consists of 18 sheets, and shows the course of the river from Wichita, Kans., to the mouth of Grand River, plotted to a scale of 1:14400; that is, 1,200 feet to one inch. The soundings show depths in feet and tenths, the dates marked in the channel indicating the days on which the soundings were taken.

Discharge Observations.

Observations to determine the discharge of the river were taken at six places, as given below. As the river during the

survey below Arkansas City was never at a stage less than 2 feet above low water, these observations will not furnish the most desirable data of this kind; that is, the actual discharge of the river at a number of points at its lowest stage.

May 10, 1884. Discharge section below southern line of Kansas:

	Feet.
Approximate height above low water	2.5
Arkansas City gauge reads above low water	1.1
Missouri, Kansas and Texas Railroad Bridge reads above low water	4.0

Discharge equal to 2,324 cubic feet per second.

May 17. Discharge section 8 miles below Kaw Agency:

	Feet.
Approximate height above low water	2.0
Gauge at Arkansas City reads above low water	1.0
Gauge on Missouri, Kansas and Texas Railroad Bridge reads above low water	3.1

Discharge equal to 1,440 cubic feet per second.

May 26, 1884. Discharge section below the mouth of the Salt Fork:

	Feet.
Approximate height above low water	4.0
Gauge at Arkansas City reads above low water	1.5
Gauge on Missouri, Kansas and Texas Railroad Bridge reads above low water	3.5

Discharge equal to 4,732 cubic feet per second.

June 21, 1884. Discharge section below the mouth of Black Bear Creek:

	Feet.
Approximate height above low water	5.0
Gauge at Arkansas City reads above low water	4.5
Gauge at Missouri, Kansas and Texas Railroad Bridge reads above low water	1.6

Discharge equal to 8,240 cubic feet per second.

July 10, 1884. Discharge section below the mouth of the Cimarron River:

	Feet.
Approximate height above low water	4.0
Gauge at Arkansas City reads above low water	4.7

Gauge at Missouri, Kansas and Texas Railroad Bridge
reads above low water 3.5

Discharge equal to 10,423 cubic feet per second.

321 July 24, 1884. Discharge section below the mouth of
the Grand River: Feet.

Approximate height above low water 3.5

Gauge at Arkansas City reads above low water 5.5

Gauge at Missouri, Kansas and Texas Railroad Bridge
reads above low water 3.5

Discharge equal to 12,352 cubic feet per second.

Probable Cost of Improvement.

The plan of improvement herein recommended being for concentrating and confining the water in one narrow channel by means of dikes and dams, the following approximate estimate is made for the construction of such works:

The prices used in making this estimate, and which are held to be low, are as follows:

Brush and stone dam	per linear foot..	\$8 00
Mattress bank revetment	do....	5 00
Wattled pile-dike	do....	4 00
Rock excavation	per cubic yard..	2 50

The estimates are made separately for the three reaches below the mouth of Walnut Creek, no estimate being made for the improvements of the river above that point.

Estimates.

From mouth of Walnut Creek to Salt Creek:

Brush and stone dams	\$110,000
Wattled pile-dike	300,000
Bank revetment	200,000
Rock excavation	20,000
Total	<u>630,000</u>

From Salt Fork to the Cimarron River:

Brush and stone dams	90,000
Wattled pile-dike	400,000
Bank revetment	270,000
Rock excavation	10,000
Total	<u>770,000</u>

From Cimarron River to Grand River:

Brush and stone dam	40,000
Wattled pile-dike	230,000
Bank revetment	170,000
Total	440,000

Total estimated cost of improvement from Grand River, Indian Territory, to mouth of Walnut Creek, Kansas, \$1,840,000.

Summary.

The distance by river from Wichita, Kans., to the mouth of Grand River is 309 miles, 77½ miles passing through a rich and cultivated part of Kansas, the remaining 231½ miles lying within the almost equally fertile but at present unproductive Indian Territory.

The cost of improving the river in Kansas would, on account of the small amount of water available during most of the year, and the numerous obstacles in the channel, never bear a just relation to the value of the commerce benefited. The lower portion of the river as far up as the Cimarron River could be made navigable at a medium stage of water for a reasonable sum, and would, no doubt, soon yield as much traffic as there is at present between Fort Smith and Fort Gibson. The improvement of the balance of the river in the Territory would be valuable only as making the river a highway for the through freight to and from Kansas, and should be so improved as to give low-water navigation in order to be of much benefit.

The main flood in the river above Grand River occurs from May to July, lasting a month to six weeks at Arkansas City and from two to three months at the mouth of Grand River. A small rise usually occurs early in the spring on the lower part of the river.

The usual yearly oscillation is 7 feet at Arkansas City and 17 feet at mouth of Grand River.

322 The mouth of Grand River is at present regarded as the head of navigation, but the traffic for a distance of 94 miles below that point—that is, to Fort Smith—is very light, being generally carried by one small boat, making irregular trips during four or five months in the year. Even between Fort Smith and Little Rock navigation is suspended

each year for a period of six weeks or two months on account of low water.

Very respectfully, your obedient servant,

F. S. BURROWS,

Assistant Engineer.

Capt. H. S. Taber,

Corps of Engineers, U. S. A.

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323 The Government offered as Exhibit 38 the following from pages III and IV of report of Chief of Engineers to Secretary of War for 1885 reading:

Be

Arkansas River/tween Fort Smith and Wichita, Kansas (under appropriations of 1880-'81-'82).—This part of the Arkansas River originally offered many obstructions to navigation in the way of shoals, snags, and overhanging trees rendering navigation very dangerous and, at certain stages of water, practically impossible.

The original plan of improvement had for its object the removal of the snags and overhanging trees and the construction of the channel at the shoals.

Up to June 30, 1885, there has been expended under this head of appropriation \$59,000.

This expenditure has been of such practical value to navigation that accidents are practically unheard of, and the river, with the exception of several unimproved shoals, is in excellent navigable condition as high as Fort Gibson, Indian Territory; above this point it will require a large outlay to make the river navigable. During the year ending June 30, 1885, \$7,875.95 have been expended in snagging operations and in a survey of certain shoals.

The amount that can be profitably expended during the year ending June 30, 1887, will be found under the preceding general head of "removing obstructions in Arkansas River, Arkansas and Kansas." (also following from page X of said annual report.)

Constitution of Survey of Arkansas River from Wichita, Kansas, to Fort Gibson, Indian Territory (provided for in the river and harbor act of August 2, 1882).—There was expended up to June 30, 1884, upon this \$6,545.55, which had carried the survey well down towards Tulsa, in the Indian

Territory. During the fiscal year ending June 30, 1885, there was expended \$2,575.43, which completed the field work in an indifferent way and plotted the notes so as to make them available.

The maps will answer for the present necessity, but will require more than the available balance on hand to complete them. The officer in charge estimates that \$1,500 will be required for this purpose and for completing the maps of the survey of the lower river, for which an appropriation was made in the river and harbor act of July 5, 324 1884.

(also the following from pages 1561 to 1562 of said report:

Improvement of Arkansas River Between Fort Smith and
Wichita, Kansas.

This part of the Arkansas River originally offered many obstructions to navigation in the way of shoals, snags, and overhanging trees, rendering navigation very dangerous, and at certain stages of water practically impossible. The original plan of improvement had for its object the removal of the snags and overhanging trees, and the contraction of the channel at the shoals. Since the original plan was adopted several surveys, have been made with a view to the permanent improvement of this reach.

Up to June 30, 1885, there has been expended under this head of appropriation \$59,000, to say nothing of certain amounts that were applied as early as 1833 to the river in general. This expenditure has been of such practical value to navigation that, wheil in former years there were regular steamboat graveyards, with numerous occupations, at present the sinking of a steamboat is practically an unheard of occurrence, and the river, with the exception of several unimproved shoals, is in excellent navigable condition as high as Fort Gibson, Indian Territory. Above this point it will require a large out lay to make the river navigable, as will be seen by referring to the report upon the survey of the river from Wichita, Kansas, to Fort Gibson. There was \$7,-875.95 available on this appropriation July 1, 1884, which amount was turned over to me by my predecessor, Major Adams. This amount was expended in the running expenses of United States snag-boat Wichita, and in the survey of Canadian, Webber's Falls, Taylor's Bar, Hildebrand's Bar,

Bouidenott, and Rabbit's Ford Shoals, with a view to giving an estimate for their improvement.

The Wichita worked July, August, September, and November, under this head, and removed during that time 659 snags, cut 732 overhanging trees, and removed one drift-pile, and left the river from Fort Gibson down in the best shape it has been in for years. She was first required to open a channel through, then to widen this channel, and finally to remove such trees on caving banks as are likely to become snags, experience showing that when the stump is severed from the trunk, the trunk alone seldom becomes a snag, and the stump sinks out of sight.

Before the heavy spring rises came on, the river as to snags for this reach was in splendid shape, and boats were making regular trips, running night as well as day. Attention is invited to the record of the boat, working, as it has, systematically back and forth, as over against her record in past years, working to finish up one place before rendering aid elsewhere. Her expenses have been:

Items:

Pay-roll	\$5,109.97	
Subsistence	1,346.86	
Fuel	554.29	
Repairs	107.15	
Office expenses	25	
Stationery	55.01	\$7,173.53

The survey referred to was made by Mr. F. S. Burrowes.

This gives all the data necessary for the estimates for the improvement of these shoals. To avoid repetition these estimates are all given under the general estimate for the permanent improvement of the Arkansas, River, Arkansas and Kansas. The expense of this survey was:

Items

Pay-roll	\$682.82	
Subsistence	19.60	\$702.42

(also the following from page 1611 of said annual report.)

Continuation of Survey of Arkansas River from Wichita,
Kansas, To Fort Gibson, Indian Territory.

The field work of this survey was completed in July, 1884, and the notes plotted to a certain extent immediately after. It became evident that the money allotted would not satisfactorily plot the notes, and work was suspended until such times as, by personal attention or otherwise, they could be put in available shape. This step was taken the more willingly as the assistant's report showed so little water above Fort Gibson, with numerous dams, &c., above Arkansas City, that it seemed likely no improvement would be recommended. During the latter part of the fiscal year, a steel steamer with a fleet of five steel barges, none drawing over 12 inches of water, has been put on the river from Arkansas City to Fort Gibson. This changes the whole face of the problem, and I am now securing all the data possible bearing on this
326 new departure. To report fully and submit proper estimates I wish to see the boat visit the southern section of Kansas and secure other data. I believe this boat is designed to produce a revolution in the matter of navigating upper reaches of shallow rivers. An enormous commerce waits this southern outlet. The notes will be worked up as far as necessary, and a full report with plans and estimates will be submitted in time for the action of the next Congress.

327

(Plaintiff's Exhibit 39.)

(House Executive Document, No. 234, 50th Congress,
First Session.)

328 50th Congress,
1st Session.

Ex. Doc.
No. 234.

House of Representatives.

Improvement of the Arkansas River.

Letter
From
The Secretary of War,
Transmitting,

In response to a resolution of the House, with a letter from the Chief of Engineers, reports and estimates of the proposed improvement of Arkansas River.

March 27, 1888,—Referred to the Committee on Rivers and Harbors and ordered to be printed.

War Department,
Washington City, March 24, 1888.

The Secretary of War has the honor to transmit to the House of Representatives a letter from the Chief of Engineers dated the 21st instant, together with a copy of a report of January 31, 1887, from Capt. H. S. Taber, Corps of Engineers, containing plans and estimates prepared by him for the improvement of Arkansas River between Little Rock, Ark., and Fort Gibson, Ind. T., and also a copy of a report of March 16, 1888, from the permanent Board of Engineers, upon the question of the improvement of Arkansas River from Wichita, Kans., to its mouth; the same being transmitted in response to House resolution of the 12th instant, calling for any information which has been sent to this Department since January 1, 1887, in regard to detailed plans and estimates for the permanent improvement of the Arkansas River between Little Rock, Ark., and Fort Gibson, Ind. T., and which is not contained in the Engineer's Report.

WILLIAM C. ENDICOTT,
Secretary of War.

The Speaker of the House of Representatives.

Office of the Chief of Engineers,

United States Army,
Washington, D. C., March 21, 1888.

Sir: In answer to the resolution of the House of Representatives of March 12, 1888, referred to this office, I have the

honor to submit herewith a copy of a report of January 31, 1887, from Capt. H. S. Taber, Corps of Engineers, in charge of the improvement of Arkansas River, containing plans and estimates prepared by him for the improvement of Arkansas River between Little Rock, Ark., and Fort Gibson, Ind. T., and also a copy of the report of March 16, 1888, from the permanent Board of Engineers upon the question of the improvement of Arkansas River from Wichita, Kans., to its mouth, being the only reports on this subject received since January 1, 1887, not contained in the Annual Report of this office for the fiscal year ending June 30, 1887.

The resolution of the House of Representatives is herewith returned.

Very respectfully, your obedient servant,

J. C. DUANE,

Brig. Gen., Chief of Engineers.

Hon. William C. Endicott,
Secretary of War.

Report of Capt. H. S. Taber, Corps of Engineers, Upon Improvement of Arkansas River From Fort Gibson, Indian Territory, to Little Rock, Arkansas.

United States Engineers Office,

Little Rock, Ark., January 31, 1887.

General: In accordance with a telegram received from the office of the Chief of Engineers dated January 25, 1887, directing me to submit plans and estimates as suggested in an indorsement of the 19th instant upon a communication from the same office, I have the honor to submit the following plans and estimates for the permanent improvement of the Arkansas River and from Fort Gibson, Ind. T., to Little Rock, Ark.

Object of the Improvement.

It is proposed to provide a channel at extreme low water that shall be nowhere less than 2 feet in depth and 200 feet wide, except that at a few shoals it may be necessary to reduce the channel to a width of 80 or 100 feet for the extreme low-water navigation.

Method.

It is proposed to accomplish the above object by using artificial means to contract the medium to low-water channel to something like the width occupied by the river twenty or thirty years ago.

At the rock shoals it is proposed to remove sufficient rock and erect suitable wing-dams to provide passage-way for the boats of commerce at extreme low water.

For over two years I have been engaged in personal conversation, as opportunity occurred, with old navigators of the river and old residents along the banks, and with my object concealed, have received uniform testimony that in past years the Arkansas River flowed through a much narrower channel, and that then, but for the snags, no boats such as now navigate it had any difficulty in doing so. This testimony is universal. With it before me this method was decided upon, not as new, but as specially applicable to this river.

Artificial Means of Contraction.

It is proposed to effect contraction by erecting suitable dikes, variously known as permeable dikes, hurdle dikes, or deposit dikes.

330 These dikes are not to exceed by very much in height the elevation of the water at a medium stage, the design being to allow the river to spread more or less during high water, but to confine it to narrower limits from medium to low water.

It is proposed to use these dikes very much after the method employed in the Mississippi River, just below Saint Louis, only upon a smaller scale, as all the elements are smaller.

Hurdle dikes, and the methods of using, are so well understood that it scarcely seems proper to devote any space to their description. They are designed to build up by deposits a bar below them and will be reduced in height as the upper reach of the river is approached. They have been thoroughly tested in this river at Pine Bluff, Ark., and not a foot of them ever lost. It is proposed to erect them in accordance with all the methods that have given success upon the Mississippi and Missouri rivers. Full details of them can be furnished if necessary.

The rock and gravel shoals will be discussed separately.

Estimates.

In 1869 a careful and instrumental survey was made of the reach in question, and a map, or series of maps, which give the positions of the bars, crossings, discharge section—in fact, all the facts necessary to form an estimate for the localities requiring improvement. About seventeen years having passed, the maps necessarily do not represent the actual condition of things to-day, since an alluvial stream, unimproved, is constantly changing its regimen.

Despite this lapse of time, however, there will be found to-day the same relative conditions of bar and bend, cut-off and old rivers, etc., so that while the works could not be located upon these maps, their length, etc., may be determined, and hence their cost, with almost as much certainty as though the maps were made within the last year. In fact, in laying down the works upon the maps preparatory to estimating the cost, I have reached points at which special improvements are now being made, and found that while the works would be located a little differently by the maps, their extent per map would have been the same as those actually being erected. (It will be borne in mind that these works are laid out in person, and in keeping with the plan of permanent improvement.)

An assistant engineer was employed to locate the worst places on the maps, and the fact that he checked every place where improvements are now going on, without his being aware of it, shows conclusively that the maps may be properly used for estimates.

Making use of these maps, studying each locality in detail, it is found that it will require, exclusive of the rock and gravel shoals, to provide the channel indicated 81,000 linear feet of primary hurdle dike, and 76,000 linear feet of secondary hurdle dike.

It is estimated that these hurdles, properly protected with a well-weighted foot-mat, can be constructed at not to exceed \$9 per linear foot for the first, and \$7 for the second; hence we have—

81,000 linear feet of primary hurdles, at \$9.....	\$729,000
76,000 linear feet of secondary hurdles, at \$7.....	532,000
Total	<hr/> 1,261,000

Shoals.

Moore's Rocks.—This consists of a ledge extending entirely across the river. The pool above is of sufficient depth to admit of opening a channel through them.

331 A channel 100 feet wide and 2 feet deep at extreme low water would require the excavation of 5,290 cubic yards of rock, which, at \$2 per cubic yard, would cost \$10,580. Seventy-five feet of free water-way may be considered ample for the present demands of navigation; hence there will be required to improve these shoals \$7,935.

Webber's Falls.—These simply require heavier dikes, as there will be stronger currents to contend with. Hence the following:

1,200 feet primary hurdles, at \$10	\$12,000
1,250 feet secondary hurdles, at \$8	10,000
Total	22,000

Canadian Shoals.—These will require one or more wing-dams to contract the water-way. It is estimated that 800 to 1,000 feet will suffice for this purpose, which, at \$10 per foot, would require \$8,000 to \$10,000; say as the total for these shoals, \$9,000.

Rabbits Ford.—These are well up towards Fort Gibson, and there is not sufficient data in my possession to enable me to give a close estimate. They are very similar to Moore's Rocks, and, with the data for their removal as a basis, it is estimated that not over \$8,000 will be required for their removal.

Summary of Cost.

General, hurdle dikes	\$1,261,000
Shoals, all told	46,935
Grand total	1,307,935

This plan, with the estimates, is condensed from the fact that the time to prepare it has been limited. Time has been given to elaboration in examinations rather than to elaboration in this plan. The data is at hand for elaboration if the same is desired.

Commerce.

The rapid increase in prosperity in this State during the two years spent at this office reminds me more of the frontier growth of the West than of the growth of a State of the age of this one.

It is a difficult matter to give in condensed form any idea of the immense quantity of produce that is waiting the opening of this river to navigation.

In a short reach from Dardanelle to Fort Smith, on the south side of the river only, about 70,000 bales of cotton are raised now and the amount is steadily increasing. This cotton can be sent to New Orleans at 60 cents per bale by boat. If sent by rail it costs \$2.25 per bale, exclusive of ferriage and cost of hauling by wagons. Corn and wheat command good prices in Little Rock, but the railroad rates are so high that it can not be moved.

Timber that sells in Little Rock as high as \$75 per 1,000 is abundant in this section, but can not be marketed owing to the high freight rates.

What has been said of this section applies with greater or less force to the entire reach from Little Rock to Fort Smith. A just conception of what benefits are likely to accrue can only be found by looking at some great fertile river valley in the Northern or Eastern States as they were years ago and as they are now, since settled up and with its river improved.

What benefits have accrued to that community will surely accrue to this, with this addition, that the mineral resources of this valley are to be added. Its coal products alone and its wealth of timber will place it well to the fore.

332 When the vast acreage of the Indian Territory is brought under cultivation its products must go this way. That already well known and exceedingly fertile State of Kansas will find Fort Smith or Little Rock its nearest water outlet eventually.

It will be seen how difficult it is to handle this question briefly if it is borne in mind that, with deep water to New Orleans from the Gulf, the Mississippi improved, and the Arkansas River navigable to Little Rock by boats drawing 5 feet of water, we have the conditions likely to exist when the improvement is completed.

I have, therefore, only attempted to outline this matter, and trust that when his portion of the report is read a map

of the territory covered may be had in mind, as this will probably be of itself the strongest proof that the benefits likely to accrue can but be too vast to be summarized in a report like this.

General Remarks.

Two tracings accompanying this to give an idea as to how the works are to be located. It will be borne in mind that these works are located on the maps, as the conditions shown on the maps require; the exact location of the works of course depends upon the condition existing at the time they are actually erected.

It is estimated that \$200,000 can be profitably expended in the fiscal year ending June 30, 1888.

A circular issued by the Little Rock Board of Trade is also forwarded as containing certain valuable information relative to the commerce of the river.

I am, general, very respectfully, your obedient servant,

H. S. TABER,

Captain of Engineers.

Brig. Gen. James C. Duane,
Chief of Engineers, U. S. A.

Report of the Board of Engineers on Improvement of Arkansas River, from Wichita, Kans., to its Mouth.

New York City, March 16, 1888.

General: The question of the improvement of the Arkansas River, from Wichita, Kans., to its mouth, having been referred by you, the Board of Engineers has the honor to submit the following report:

The data in reference to this part of the river are mainly contained in the reports of the following surveys:

(1) F. S. Burrows, November 6, 1884. Survey of Arkansas River from Wichita, Kans., to Grand River, 309 miles. (House Ex. Doc. No. 90, Forty-ninth Congress, first session.) Traced map, scale 1/14400.

(2) S. T. Abert, February 28, 1870. Survey of Arkansas River from Grand River (Fort Gibson) to Little Rock, 286 miles. (House Ex. Doc. No. 2895, Forty-five Congress, second session.) Lithographed atlas, scale 1/12000.

(3) C. E. Taft, June 1, 1885. Survey of Arkansas River, from Little Rock to its mouth, 176 miles. (Report of Chief of Engineers, 1885, page 1604) Lithographed atlas, scale 1/28800.

The Board has also received information from Capt. H. S. Taber, and has examined the river at numerous points.

333

Report.

The length of the Arkansas River between Wichita, Kans., and its mouth is 771 miles. For the purposes of improvement this part of the river may be divided into three sections: (1) from Wichita to the mouth of the Canadian River, 346 miles; (2) from the Canadian River to Little Rock, 249 miles; (3) from Little Rock to its mouth, 176 miles.

Ascending the river and neglecting the White River cut-off near its mouth, the Canadian River is the first important tributary; above it, within 120 miles, are two other important tributaries—the Grand and the Cimarron. From the Canadian River to the vicinity of its mouth, as there are no tributaries of importance, the discharge of the Arkansas River does not largely vary, while above the Canadian, the Grand, and the Cimarron it becomes a comparatively small stream. Accordingly, the stretch from Wichita to the Canadian River has been taken as the first section. While the discharge of the river below the mouth of the Canadian does not vary largely, the form of the river does, the dividing point being near Little Rock. Below this point the river has the numerous bends, the cut-offs, and the caving banks of the Mississippi below Cairo; above this point the river often touches the bluffs, has the smaller curvature of the Upper Mississippi, and has very few cut-offs. Little Rock may be taken as the dividing point between the second and third sections.

These sections will be considered in order.

First Section—Wichita to Canadian River.

(346 miles.)

The data as to gauge readings and discharges for this portion of the river are very deficient, especially those for the cardinal discharges, namely, at extreme low and high water. Burrows' report gives an observed discharge at the Kaw Agency, 102 miles below Wichita, of 1,440 cubic feet per second, the stage being about 2 feet above low water. The Board has a gauge record for Wichita only from April 1 to

August 31, 1884. Between April 1 and May 28 the gauge varied from 0.8 to 2.5 feet above supposed low water; between May 29 and July 21 between 2.6 and 5.5 feet; and in August between 3 and 2 feet. With a range during the high water, which comes usually in June, of only 5.5 feet, it will be seen that a discharge of 1,440 cubic feet at a stage of 2 feet above low water would be largely reduced at low water, probably to 500 or 700 cubic feet.

It will be seen hereafter that the discharge of the Arkansas River at Little Rock probably does not exceed about 2,000 cubic feet per second at extreme low water. The low-water discharge of the Canadian is unknown, but as this river, for some distance above its junction with the Arkansas, has a high-water width of about 700 feet, while the Arkansas above the same point has a width of about 1,000 or 1,200; and since the Canadian approaches the Arkansas both in length and in drainage area, the low-water discharge of the Arkansas just above the Canadian is probably 500 cubic feet less than at Little Rock, or does not exceed 1,500 cubic feet per second. Hence, from Wichita to the Canadian River, the low-water discharge probably varies between about 500 and 1,500 cubic feet per second.

On January 24, 1887, a discharge of 2,972 cubic feet was observed at Fort Smith, the gauge reading + 0.9. The average slope of the Arkansas River between the Canadian and the Grand River is 1.2 feet per mile for 37 miles; between the Grand River and the Cimarron 2 feet per mile for 334 82 miles; and between the Cimarron and Wichita, Kans., 2.7 feet per mile for 227 miles. For 37 miles below Wichita the slopes vary from 3.5 feet to 4.28 feet per mile. Below Wichita the general width between banks is 600 or 700 feet, but it varies from 300 feet to 1,200 feet. The river oscillation in exceptional years at Wichita may be 2 or 3 feet greater than the 5 feet observed in 1884.

The numerous small tributaries, and the Cimarron especially, increase the dimensions of the river, so that between the Cimarron and the Grand the width of the Arkansas at high water varies from 700 to 3,000 feet, the general width being 1,200 feet. The low-water width varies from 500 to 1,500 feet. The oscillations also increase, amounting in 1884 to 15 feet, and are usually 17 feet. At the mouth of the Canadian the oscillations are probably about the same as at Fort Smith, 55 miles below, where the extreme oscillation, since gauges were established, is about 30 feet, 39 feet being however, reported in 1833.

Between Wichita, Kans., and Grand River there are seven bridges without draws, and there are two dams at Oxford and Arkansas City, respectively 42 and 67 miles below Wichita.

In 1884, at the time of the survey, the river for 7 miles below Wichita was at a low stage. Mr. Burrows reports—

A channel 1 foot in depth was found most of the way, but it is so narrow and winding as to be of no practical utility for navigation, even in a skiff. At a number of places the greatest available depth found was from 3 to 6 inches.

The commerce over this section of the river is and always has been practically nothing.

In view of the small low-water flow in this section, which, for two-thirds of its length perhaps does not exceed 700 cubic feet per second, nor any where exceed 1,500 cubic feet; in view of the high slopes of the river, exceeding 3 feet per mile in the upper portion of the section, the Board is of the opinion that the cost of any general improvement by contraction works of this section which aimed at obtaining even as much as 2 feet at low water would far exceed the value of the resulting advantages. Indeed, the Board has grave doubts as to the possibility of maintaining 2 feet of navigable depth at low water by such means. Should there be in the future sufficient need of steady water transportation along this portion of the valley to justify the expense, movable dams or a canal would be the proper method of obtaining it. There are no surveys at present which would enable the cost of dams or a canal to be estimated.

It may be remembered that hope of improving the Wisconsin River below Portage, where the low-water discharge is about 2,000 feet per second, and the average river slope about $1\frac{1}{2}$ feet per mile, has, after a long experiment, finally been abandoned.

Second Section—Mouth of Canadian River to Little Rock. (249 miles.)

Neglecting the White River cut-off near the mouth of the Arkansas River, the Canadian River is the lowest important tributary of the Arkansas. Below the mouth of the Canadian it only receives water from a narrow drainage valley through small streams. Its discharge at the upper end of the section can be but little less than at Little Rock. The minimum low

water discharge at Little Rock is estimated at 2,000 cubic feet per second, and the high-water discharge for a gauge reading at Little Rock of 26 feet is estimated at 150,000 cubic feet per second. The average slope of the river for this section is 0.84 foot per mile, but on shoals it rose to 3 feet per mile for from 600 to 2,000 feet at the time of the survey, when the river varied between 2.6 and 22 feet above low water. At extreme low water the slopes on shoals are doubtless greater. The high water width of the undivided river varies from about 600 to about 3,000 feet, its average value for stretches of 50 miles varying between 1,700 and 1,900 feet. The minimum high-water width of the river where not affected by rock bluffs is about 700 feet. In straight portions of the river a width of 1,000 feet gives a channel low-water depth of about 5 feet.

The oscillations along this section of the river do not seem to differ widely.

Years.	High water reported at—	
	Fort Smith.	Little Rock.
	Feet.	Feet.
1844.....	35.5	35.0
1866.....	29.8	30.0
1884.....	27.9	26.3

These were years of very high water, and 26 above low water at Little Rock is now considered high water. The duration of different stages of the river is of interest, and is given in the following tables for Fort Smith and for Little Rock, 194 miles below.

(Maximum gauge reading, 27.9 February 14, 1884, and April 26, 1885. Minimum gauge reading, 0.0, February 6, 1887.)

Gauge reading.	Average number of days in—											Total days per year
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1 foot or less.....	4.4	0.6	.....	2.4	.....	.....	.....	1.2	.....	.....	.....	1.8
1.1 to 2 feet.....	1.8	1.2	1.0	1.6	.....	.....	1.5	3.8	.....	4.4	5.8	4.4
2.1 to 4 feet.....	6.6	3.6	3.4	1.2	3.2	1.7	4.7	6.3	12.8	10.4	9.0	9.0
4.1 to 6 feet.....	11.4	5.4	9.4	8.8	8.6	6.3	11.7	10.7	13.0	6.8	8.2	9.6
6.1 to 10 feet.....	3.8	7.4	14.2	11.6	11.0	12.3	9.2	7.2	1.8	7.6	7.0	3.6
10.1 to 15 feet.....	2.6	5.4	3.0	2.8	4.0	7.2	1.8	1.8	1.6	1.8	.....	2.0
15.1 to 20 feet.....	0.4	2.4	.....	0.2	3.6	1.7	1.8	.....	.08	.....	.....	0.6
20.1 to 27.9 feet.....	.....	2.2	.....	1.4	0.6	0.8	0.3	.....	.....	.....	.....	11.5
												5.3

Gauge readings Arkansas River at Little Rock from July, 1879, to October, 1887, inclusive.

(Maximum gauge reading, 26.3, February 16, 1884. Minimum gauge reading, 0.9, October 12-22, 1879.)

Gauge reading.	Average number of days in—											Total days in year.
	Jan.	Feb.	Mar.	Apr.	May.	June.	July*	Aug.	Sept.	Oct.	Nov.	Dec.
1 foot or less.....	.....	.....	.....	.....	0.6	0.9	0.9	2.4	8.3	7.0	5.6	2.3
1.1 to 2 feet.....	3.3	.....	.....	1.4	1.1	0.6	2.2	8.8	4.0	3.9	3.4	6.0
2.1 to 4 feet.....	6.6	2.4	1.3	2.8	2.1	3.4	8.7	8.3	10.1	8.3	7.1	10.0
4.1 to 6 feet.....	11.0	3.8	3.3	4.9	5.6	3.3	8.8	5.8	5.4	4.9	5.8	4.8
6.1 to 10 feet.....	5.9	8.0	12.9	14.4	8.1	12.0	6.6	5.3	0.8	5.4	7.3	5.1
10.1 to 15 feet.....	3.3	6.0	12.0	5.8	7.4	6.4	2.2	0.6	1.0	1.4	0.9	1.6
15.1 to 20 feet.....	0.5	4.9	1.4	0.1	4.1	2.9	1.3	.....	0.3	.....	.....	1.0
20.1 to 26.3 feet.....	0.5	3.3	0.3	0.8	1.9	0.6	0.2	.....	.....	.....	.....	0.3
												7.9

*In the month of July, 1883, gauge readings for nineteen days only are given; they have been included in this table by giving this month a weight of 0.6 in computing the monthly average.

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These tables, not covering quite the same periods, are not strictly comparable. They indicate, however, at the per station, a smaller number of days in the year for which gauge-reading of less than 4 feet may be expected than at lower, the numbers being 107.8 against 132.8 days, and a smaller number of days for which a gauge-reading greater than 10 feet may be expected, the numbers being 50.8 days and days.

The smaller number of days at Fort Smith, with a gauge reading of less than 4 feet, is probably due to the non-coincidence of the periods covered by the tables, and to the fact that gauge zero at Little Rock is 0.9 above the lowest water in the tables. As navigation begins to find trouble when Little Rock gauge falls to about $3\frac{1}{2}$ feet, it appears, from table, that the difficulty usually exists about 100 days in year.

An examination of Abert's map shows in this section that river touches rock or a formation older than its own alluvial, on one side or the other, on an average once in 3 or miles; that where its banks are of alluvial the low-water depths in moderate bends usually do not exceed 8 or 10 feet, in sharp bends 13 feet.

Where the river is in contact with rock the depths may be much greater. In straight reaches of the river, even where high-water width is only 1,200 feet, the depths do not usually exceed about 5 feet, and sink sometimes to 3 feet. The minimum velocities reported by Abert at mid-depth are usually less than 7 feet per second for medium stakes, rising, however, to 10.5 feet, the river being 14.5 above low water.

At some points the map indicates rock in the channel. As usual in rivers, the shoalest places are where the current crosses from one concave bank to the other. Although the map indicates at such crossings smaller low-water depths than 12 of 14 inches which occur below Little Rock, this may in part be due to the uncertainties in the reduction of the soundings to low water. At the low-water stage broad bars of mud or sand with gravel show themselves between the higher banks.

The table given in Appendix A, is reliable, shows that this river at Little Rock carries an enormous amount of sediment. From Captain Taber's observation, made about once in five years, between September 12 and October 26, 1887, it appears that the amount of "moist" sediment by weight varied be-

tween $1/17$ and $1/53$ of that of the water carrying it, with one exception, when it sank to $1/209$. The stage of the river was not high, varying from 1.9 to 7.5 feet. Had the sediment been dry these figures would probably be reduced to one-third of the above values.

High and low water discharges at Little Rock, already taken as 150,000 and 2,000 cubic feet per second, show how insignificant is the river at low water when compared with the river at high water. Its volume is about $1/76$ as great; its velocity is about one-half that of the river in flood. The high river has about 300 times as much energy as the lower river. The low stages of the river form and maintain the low-water navigation, and their ability to do it is small. The mean and high stages of the river move large masses of material, form shoals and fill up low-water channels, and their ability to do so is very great. Moreover, the low-water river is not only small, relatively, to the high water river, but is small absolutely. Taking its discharge of 2,000 cu. ft. per second, and the mean velocity as 2.1 ft. per second, a channel with a depth of 3 ft. for 240 feet wide and with side slopes of $1/20$, giving a surface width of 360 feet, would carry this amount of water. The velocity of 2.2 feet per second for 3 feet depth corresponds to a slope of about 1.6 feet per mile, which is exceeded on many crossings. As the average width of this section of the river between high-water banks is 1,800 of 1,900 feet, contraction to 360 feet involves a large amount of work. Since the contraction works must rise 4 or 5 feet above low water, they will tend to increase flood heights, and their outer portions will be much exposed, as it can not be expected usually that they will be covered by sand.

The difficulties in the way of a solution of the problem by contraction works are so great that the plan of movable dams has been examined in such an approximate way as is practicable without surveys for that purpose. They would easily give 5 feet or more of water at all times, and hence, should any large traffic be developed, hereafter, would be far more advantageous during low-water than any system of contraction works. But their cost from Little Rock to the mouth of the Canadian River would be about \$14,000,000.

Experience both in this country and in Europe has shown, where water-ways and railroads serve the same districts that the water-ways in general carry those freights of so small value per pound that the freight forms an important fraction of their cost. There is not at present enough of such freights to

justify the Board in recommending the system of movable dams for this section.

If the system of movable dams is not admissible the only remaining method of increasing low-water depths is by works of contraction; by the closure of side channels, and by bank protection.

The ends to be attained are a sufficiently large high-water section for free flood flow and a sufficiently small low-water section to maintain the depth of at least 3 feet, which is near the minimum for economical navigation. With a low-water discharge of about 2,000 cubic feet per second, there is little hope of obtaining by contraction works of greater depth; and uncertainty that that can be obtained at reasonable cost.

In any estimate of the dimensions needed for the high and low water sections it must be remembered that they are only approximations, and that experience must determine what is best. As a mean velocity of about 2.2 feet per second at low water would increase to over 4 feet when the river was at the level of dikes 5 feet above low-water, and as this or a greater velocity is desirable to act on the deposits made by the high river, the value, 2.2 feet, has been taken in estimating the low-water cross-section previously given, which has a surface width of 360 feet and a depth in the middle of 3 feet. While this amount of contraction, or one still greater, will probably be required ultimately, when bars are cut down and pools lowered, it is possible that in the works first undertaken a considerably less contraction will for a time give the desired low-water depth. Hence the Board would not propose in the first works a contraction of the low-water river to less than 500 feet; and as spurs should generally be used on convex banks, a further contraction could be effected by their extension when experience show the proper amount.

As these contraction works should begin to act before navigation now finds difficulty, which is at a stage of about $3\frac{1}{2}$ feet, they should rise near the channel 4 or 5 feet above low water and their height should slightly increase towards shore. In estimating the dimensions of the high-water section needed to carry 150,000 cubic feet per second, it may be observed that the river in this case where it is unaffected by rock banks rarely falls below 1,000 feet in width in a straight reach, this width now giving a depth at low water of about 5 feet. A
338 mean depth of 25 feet with average slope of this section would give a mean velocity of 6.4 feet per second, and
21—5434

to discharge 150,000 cubic feet per second would require a width of but 940 feet. A much higher velocity is not desirable as it would have a powerful action on the works and on the river-bed. The high-water width should not be reduced below 1,000 or 1,200 feet, even if in the face of the velocities it were practicable. On some rivers it may be hoped to obtain improved navigation by the contraction of the high-water river alone, but this is the case only when the low-water flow is not too small in comparison with the high-water flow, and when the low-water depth aimed at does not approach closely the greatest depth that it is practicable to obtain by contraction works.

The Arkansas is not such a river. The average high-water widths for stretches of 50 miles between Little Rock and the Canadian River vary between about 1,700 and 1,900 feet. Contraction works that limit the low water to 360 or 500 feet would occupy a large part of the total width of the river. They will be obstructions to high-water flow, and at stages between 6 and 12 feet they will be obstructions to navigation; hence the channel between them should be as wide as is consistent with maintaining the depth desired, and they should be as low as will give the needed scour. The works of improvement should consist of dams closing side channels, dikes, and of bank protection where the banks are already caving, or would cave, in consequence of the contraction works.

The ideal form of river to be approached is one having a uniform high-water width of 1,000 or 1,200 feet, and a low-water width small enough to maintain 3 feet depth at low water.

The contraction works should consist of longitudinal dikes and spurs.

To give a regular channel when spurs are used on a concave shore, the intervals between consecutive spurs should rarely exceed the width of the channel desired. With a river width six times the proposed channel width this would usually give a very great development of spurs, and longitudinal dikes on concave shores and on straight shores will usually be found not only better but more economical, since the cross-dikes connecting them with the shore can have much greater intervals than would be permissible for spurs designed to give a regular channel.

Where they will be short and on convex shores, spurs can be used.

The choice will depend on the state of affairs at the site when the work is begun.

As it can not be expected or desired that the contraction works will diminish the high-water width to less than about 1,200 feet, nor that they will in this width be habitually buried in sand, these portions must be permanent; and wood should not be used for permanent work unless it will be habitually wet. The contraction works as a rule will be on sand-bars or in shoal water, and dikes and spurs of stone, or stone and gravel, will not usually be much more expensive than piled dikes, and will be permanent.

Hence the general method of construction should be that used on the Upper Mississippi rather than on the Lower Mississippi where there are great depths of water.

Where in a wide reach deep water is to be crossed near shore and it is hoped from the great amount of sediment carried at times by the river that high-water banks can be rapidly built over the works, piled dikes or hurdles may be advantageous, the new bank being afterward made permanent by a covering of stone.

339 Stone dikes should be 5 feet wide on top, the top stones being heavy enough not to be removed by the current. When gravel can be obtained readily the large ones should have a hearting of gravel. They should usually have a mattress foundation and a good apron of mattress or of stone and gravel, to diminish settlement from scour or overflow. Those first built should not rise more than 4 or 5 feet above low water at the channel, and cross-dikes and spurs should rise gradually towards the shore. The channel ends of spurs should have a gentle slope towards the channel, say 1 on 10.

Wherever there is danger that the contraction will cause caving of banks, those banks should be protected by a covering of stone. Longitudinal dikes should have gaps in them about once in a mile, to avoid at all stages much difference of head on their two sides.

In the improvement of this section by contraction those places should first be chosen which now give the greatest trouble to navigation, and in these it is not at first proposed to contract the low-water river to less than about 500 feet. But as when the water is deepened on a shoal-crossing, the slope is reduced and the pool above is lowered so that new shoals come into action, which must also be improved, was new shoals may be built wherever the river is not controlled,

the improvement requires works which become closer and closer until they are almost continuous on rivers where the greatest improvement possible is desired.

Thus on the 223 miles of the Prussian Rhine the aggregate length of shore with bank protection or contraction works exceeds the length of the river, though the river has long stretches of deep water. The engineer Jacquet, under whose plan the Rhone has been so successfully improved below Lyons, declares that it is "absolutely necessary to rectify and permanently fix the entire course of the river." The experience on the German rivers is essentially the same. As on their rivers the improvements are near completion, their results are much more reliable than those from our own rivers, where scarcely more than a beginning has been made.

The lowering of pools referred to above has been observed on many rivers, and is especially notable on the Rhone, where the low-water surface at Lyons has been lowered nearly 5 feet by the work done below. Submerged dams (*grundschwellen*) are now used on the Rhone and on the larger German rivers to prevent this fall of the low-water surface by increasing the slope in pools, thus counterbalancing the loss of slope on shoals. Since these are expensive, their use is not proposed for the Arkansas till experience has shown that the low-water surface will be so much lowered as to make them necessary.

At some points in this section rock is found in the bed of the river. Should the improvement not lower seriously the low-water surface of the river, a channel can be formed at these points at a moderate expense. But should serious lowering occur, submerged dams or a movable dam would have to be used.

In this section of 249 miles Abert's map shows 61 miles with a low-water depth less than 4 feet, 92 miles with depths of from 4 to 8 feet, and 96 miles with depths over 8 feet, rarely reaching 16 feet unless where there is a bank of rock.

To secure 3 feet the works should first be applied to the whole of the 61 miles where there is now 4 feet or less. This, as appropriations are usually made, will require many years. In the meantime, new shoals will develop on the unimproved part of the river from the action of natural causes and from

the reduction of slope produced by the works. The
340 works then will have to be much extended. All side channels will have to be closed. Where the contraction works cause caving of the opposite bank, that bank will have to be revetted; and other caving banks must be revetted

to prevent injurious changes in the river where it is now good. In view of the very great difficulty of improving this river, arising from its very small low-water discharge, the cost of some stretches of 10 or 12 miles will approach \$100,000 per mile, and its final and permanent improvement to 3 feet will, on an average, cost \$40,000 per mile, or for this section \$9,960,000.

The uncertainty in estimating the cost of improvement of rivers like this does not arise from the difficulty in estimating the cost of a given project, but from the uncertainty as to the changes which it will produce or which nature will produce in the river while the project is being executed. For this reason actual experience on rivers where much work has been done is a safer guide than the estimated cost of a given project.

The Prussian portion of the Vistula is 140 miles long and the high-water discharge at Kurzebrack, 47 miles above its mouth is 213,000 cubic feet per second. A depth of 4.6 feet is aimed at, at average low water. The regulation of the river in 1880 was about half completed, and the estimated final cost was \$25,000 per mile for 140 miles.

The Prussian Elbe is 261 miles long. The high and low water discharges at Torgau are 63,000 feet and 3,100 cubic feet per second. A depth of 3.8 feet for lowest Madgeburg stage is aimed at. Excluding work done before 1861, \$3,300,000 had been spent in 1880, and \$2,100,000 was needed to complete the work. This gives an average since 1861 of \$20,000 per mile.

At Kehl the Rhine has a high-water discharge of 171,000 cubic feet per second, and a low-water discharge of 12,000 cubic feet. The depths aimed at for low-water are 6½ feet between Bingen and Coblentz and 8 feet between Coblentz and Koln. The work on the Prussian portion of the Rhine in 1880 was about half done, and, excluding 13 miles between Biebrich and Bingen, the estimated final cost was \$10,000,000, or about \$45,000 per mile for the 223 miles in Prussia, although it has long stretches of deep water.

On the Rhone between Lyons and Arles, a distance of 175 miles, \$4,800,000 had been spent, or \$27,000 per mile, prior to 1860, largely on bank defense. From 1860 to 1878 work went on, but the expenditure is unknown. In 1878, an appropriation of \$9,000,000 was made for this stretch. In November, 1887, about \$1,600,000 of this remained unexpended, and with it the engineers expected to make the low-water depth 4.6 feet,

a depth of $5\frac{1}{4}$ feet having been aimed at. Originally there were shoals with but 1.3 feet on them. The average cost at the exhaustion of the balance will be \$55,000 per mile this, however, being only the expenditure since 1878. The Rhone has at Lyons a high-water discharge of 245,000 cubic feet per second, and a low-water discharge of 7,300 cubic feet. The interval between the contraction works in the section below Lyons is from 390 to 490 feet, giving a channel of that width.

These parts of rivers in their upper portions do not differ very widely from this section of the Arkansas in magnitude at high water; but they have the great advantage of a relatively large low-water flow. Thus the ratio of high to low water discharge on the Arkansas at Little Rock is $1/70$, while for the Rhine at Kehl it is $1/13$; for the Vistula at Kurzebrack it is $1/25$; and for the Rhone near Lyons it is $1/23$. Nor do the slopes of these rivers differ very widely from that of this section of the Arkansas save in the case of the Rhone, 341 where it is much larger; but its large low-water flow of 7,300 cubic feet per second partially compensates for this in the improvement point of view.

On the Loire the ratio of discharges at Orleans is $1/260$, the low-water discharge being 875 cubic feet per second, and the improvement of the Loire by contraction after several attempts was finally abandoned.

The experience gained on the Mississippi below Saint Louis led Major Ernst to estimate the cost of improving the river from Saint Louis to Cairo at an average of \$110,000 per mile for the whole distance.

In view of these results of experience the Board is of opinion that a permanent and finally completed improvement will on an average cost, as stated, above \$40,000 per mile. In a river so shoal and with the low-water flow so small many disappointments must be expected, as the difficulties are very great, and while the Board is, on the whole, of the opinion that 3 feet can be obtained at the cost sated, there is no absolute certainty about it.

In any case the period of about one hundred days in which navigation now finds difficulty would be very largely reduced.

Third Section—From Little Rock to the Mouth of the Arkansas River.

(176 miles.)

Below Little Rock the river assumes the general forms shown by the Lower Mississippi. Great curvature, frequent

cut-offs, and considerable caving, estimated by Captain Taber as averaging in bends 30 or 40 feet per year, are found. The numerous cut-offs would, however, seem to indicate a higher rate of caving.

Captain Taber states that navigation first becomes difficult at a $3\frac{1}{2}$ foot stage when there is about $2\frac{1}{2}$ feet on the shoalest bars, and that the least depth on these bars is 12 to 14 inches.

Besides the great increase in curvature below Little Rock, there is also a large increase in average depth.

Above Little Rock in 249 miles one-fourth of the river has a low-water depth of 4 feet or less, and but four-tenths of it has a depth of 8 feet or more.

Below Little Rock in 176 miles one-seventh of the distance has a depth of 4 feet or less, and five-sevenths has a depth of 8 feet or more. Below Little Rock the greatest depth in alluvial bends reaches 54 feet at low water, while above it rarely exceeds 13 feet.

Above Little Rock the river is in contact with high ground every few miles; below, only at Red, White, and Pine bluffs. In the first and second 50 miles above Little Rock the average width between high-water banks (including side channels) is 1,889 and 1,899 feet, respectively. In the first 50 miles below Little Rock it is 2,425 feet; in the second 50 miles it is 2,194 feet; below Little Rock it is 2,425 feet; in the second 50 miles it is 2,194 feet; and in the next 50 miles it is 1,520 feet; this gradual narrowing of the river corresponding with the increase in depth. Connected with these depths and widths is the variation in the material of the bed and banks; above Little Rock gravel is common in connection with sand; some gravel is seen not far below Little Rock, but in the lower part of the river there is sand with some clay.

Unfortunately the Board has at its command no discharge determination made very near low water, and hence does not know accurately the low-water discharge of the Arkansas at Little Rock or Pine Bluff. Humphreys and Abbot give a minimum discharge at Napoleon of 2,318 cubic feet per second. Observations made under Major Suter at Pine Bluff gave 4,400 cubic feet at a gauge-reading at Little Rock of 1.3 feet, and the discharge curve prolonged downward would give 2,500 cubic feet discharge at 0.0 of the Little Rock gauge. A discharge observation at Little Rock Decem-

ber 6, 1886, gave 4,365 cubic feet per second for a gauge-reading of 2.1 feet.

The imperfect curve prolonged downward would give a zero discharge at 1 foot on the gauge. The lowest known stage at Little Rock is—0.9 foot, and at this stage the discharge probably did not exceed 2,000 cubic feet per second. The highest discharge observed under Captain Taber at Little Rock was 110,000 cubic feet for a gauge-reading of 18 feet. For a high-water stage of 26 feet this would probably increase to 150,000 cubic feet per second. The average slope of the river from Little Rock to the mouth is 0.66 foot per mile, averaging 0.8 foot per mile in the first 50 miles below Little Rock, where the high-water river is wide.

In considering the improvement of the Arkansas River below Little Rock it is to be noticed, (1) that its discharge at all stages is nearly the same as above Little Rock; (2) that its average slope is less; (3) that excepting the portion immediately below Little Rock its average width between high-water banks is less; and (4) that its percentage of shoal water is much less.

Having equal discharges, the high water and low water cross-sections to be aimed at will not differ widely from those above Little Rock, for while the slopes are somewhat less, the effect of this on velocities is partially balanced by the greater depths, probably leaving, however, somewhat lower average velocities below Little Rock than those above. This lower velocity and the greater average low-water depth, due to the natural causes acting, and the material on which they act, justify the expectation that an equal contraction will give a foot greater depth below Little Rock than above, or 4 feet at low water.

In improving this section of the river the same contraction should be given as in the section above, and essentially by the same means, namely, spurs on convex shores, longitudinal dikes, where they will form a concave bank or spurs would be long, and bank protection of stone where caving is going on, or is to be expected as the result of contraction works. Where the water is shoal or dikes are on sand-banks, works of stone, or stone and gravel, which will be permanent, should be used in preference to wood-work. But in some places the water at low stages may be so deep that pile dikes should first be used on account of cheapness, and when they have raised the bottom sufficiently, the work can be made permanent by adding stone. The heights in general should be those specified for

the section above, but where pile dikes are used they may, leaving a high-water channel 1,000 or 1,200 feet wide, be higher where it is hoped they may build up a new high-water bank.

The greater depth will increase the cost both of bank protection and of dikes, and the needed amount of bank protection, where the curvature is so great, will be much increased, these increases, however, being balanced by the greater lengths of deep water, so that contraction works less nearly continuous at their final completion than on the river above Little Rock will be required. The cost per mile will on the whole be about the same as above Little Rock.

Near the mouth of the Arkansas a large bayou or cut-off connects it with the White River, so that a flood in one of these rivers when the other is lower, will send a portion of the flood through the mouth of the other into the Mississippi.

When the Mississippi is in its high stages and the Arkansas is low, the back-water of the Mississippi affects the height of the Arkansas far above its mouth, and the low velocities near the mouth of the Arkansas tend to give deposits there. Should the river above be improved to 4 feet, the question of
343 some improvement between the White River cut-off and the Mississippi will have to be considered. A long series of gauge-readings at the White River cut-off and rough observations of direction and amount of discharge through the cut-off, would be needed before a decision could be made as to the methods to be used, if such improvement became necessary. It might be necessary to close the cut-off or one of the mouths, at a cost of some hundred thousand dollars.

The estimated cost of the permanent improvement of the 160 miles from Little Rock to the White River cut-off, at \$40,000 per mile, is \$6,400,000.

This estimate is much larger than that submitted by Captain Taber. It is noted, however, that Captain Taber's estimate makes no provision for bank protection, which for alluvial soil experience everywhere in river improvement shows to be necessary in connection with contraction works, nor for the improvement of new shoals which will be developed by natural changes in the river long before the works proposed by him are completed, nor for any lowering the low-water surface and development of new shoals in consequence of cutting deeper channels through existing bars, nor for the considerable loss of work, which is inevitable where works struggle with river floods.

For the 176 miles from Little Rock to the Mississippi, by way of the White River Cut-off, his estimate would be but about \$15,000 per mile. Experience on rivers which have been actually improved shows that it is much too small.

Adding to the estimate of \$9,960,000 already made for the cost of an improvement to give 3 feet at lowest water from Little Rock to the Canadian River, the estimate of \$6,400,000 to give 4 feet from Little Rock to the White River Cut-off, the aggregate is \$16,360,000 for 409 miles of river.

Much immediate relief to existing commerce would be given by removing snags from Fort Smith to the mouth.

Mr. Taft states in his report that the greatest demand for steamboat service exists between Pine Bluff and the Mississippi River (this distance being 110 miles); that "one packet, making two trips per week, is amply sufficient to do all the business between Pine Bluff and below for the greater part of the year;" and that "there is one steamboat of about 200 tons making regular trips between Pine Bluff and Little Rock;" that "occasionally there are other boats plying in the river trade, but the demand for their services, as a rule, is not sufficient to remunerate their owners."

But the State of Arkansas is rapidly developing, and both it and the Indian Territory have great possibilities before them.

The difficulty in improving this river for low-water navigation on account of its small low-water discharge, and the uncertainty which in some degree exists as to success have already been adverted to. It is for Congress to judge whether the prospective commerce will be sufficient to justify the cost.

THOS. LINCOLN CASEY,
Colonel, Corps of Engineers.

HENRY L. ABBOT,
Col. of Engineers, Bvt. Brig. Gen.

C. B. COMSTOCK,
Lieut. Col. of Engineers and Bvt. Brig. Gen.

D. C. HOUSTON,
Lieut. Col. Engineers, Bvt. Col.

W. R. KING,
Major of Engineers.

The Chief of Engineers, U. S. A.

344 A.—Deposit of sediment in the Arkansas River at Little Rock, Ark.
(Derived from data furnished by Captain Taber. Sediment weighed moist
after drawing off the water.)

Date	Water weight.		Days allowed to settle.	Sediment, ounces avoirdupois.	Gauge 6 a. m.	Proportion weight of sediment.	Remarks.
1887	Lbs.	Oz.		Oz.	Feet.		
May 30	6	8½	5	½	6.9	1/209	Water red; medium thick.
June 4	6	8½	5	½	5.6½	1/209	Do.
8	6	9½	4	1½	6.1	1/70	Water red; some thick.
13	6	9¼	5	1¼	6.4½	1/84	Do.
15	6	9½	3	1½	7.9	1/70	Water dark and thick.
20	6	12½	5	4½	8.6½	1/24	Do.
24	6	11½	4	3½	7.2	1/31	Water red; medium thick.
28	6	9	3	1	4.9	1/105	Do.
July 1	6	9½	3	1½	4.0	1/70	Do.
5	6	9	4	1	5.4	1/105	Water dark and thick.
9	6	9	4	1	4.7	1/105	Water dark and medium.
13	6	9½	4	1½	5.8	1/70	Do.
16	6	9	3	1	5.6	1/105	Do.
23	6	8½	7	½	3.3	1/200	Water medium clear.
28	6	8½	4	½	2.7	1/209	Water clear.
Aug. 1	6	8½	3	½	2.6	1/209	Do.
4	6	8½	4	½	2.0	1/209	Do.
10	6	8¼	6	¼	2.0	1/417	Do.
15	6	8¼	5	¼	1.5	1/417	Do.
19	6	8¼	4	¼	2.0	1/417	Do.
23	6	8¼	4	¼	1.8	1/417	Do.
29	6	8¼	6	¼	1.9	1/417	Do.
Sept. 2	6	8¼	4	¼	1.8	1/417	Do.
6	6	8¼	4	¼	2.8	1/417	Do.
12	6	8¼	6	¼	3.6	1/417	Do.
16	6	9½	4	1½	3.5	1/70	Water medium muddy.
20	6	11½	4	3½	2.7	1/31	Water thick, muddy, and dark.
24	6	11	4	3	2.4	1/36	Do.
30	6	10	6	2	2.4	1/53	Water medium muddy.
Oct. 5	6	10	5	2	1.9	1/53	Do.
10	6	11	5	3	1.9	1/36	Do.
14	6	8½	4	½	1.7	1/209	Water medium clear.
18	6	12	4	4	4.8	1/27	Water very muddy.
22	6	14½	4	6½	7.5	1/17	Do.
26	6	11	4	3	4.3	1/36	Water medium muddy.
31	6	9	5	1	2.2	1/105	Do.
Nov. 4	6	9	4	1	1.9	1/105	Do.
8	6	9	4	1	1.5	1/105	Do.
16	6	8¼	8	¼	1.1	1/417	Water clear.
21	6	8¼	4	¼	1.1	1/417	Water very clear.

1882.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....						17.2	5.6	4.5	3.5	3.9	4.3	4.6
2.....						16.4	5.4	4.3	3.4	4.2	4.4	4.5
3.....						16.2	5.3	4.2	3.3	7.6	4.5	4.4
4.....						14.8	5.1	4.3	3.2	6.7	4.6	4.3
5.....						12.7	4.9	4.2	3.2	5.6	5.7	4.2
6.....						10.8	4.7	4.3	3.2	4.7	5.5	4.1
7.....						9.9	4.6	4.2	3.2	4.2	6.3	4.0
8.....						9.2	4.4	4.2	3.2	4.2	6.6	3.9
9.....						8.3	4.2	4.2	3.2	4.2	5.8	3.8
10.....						7.8	4.2	4.2	3.3	4.4	4.8	3.7
11.....						7.3	4.2	4.0	3.2	5.2	4.5	3.5
12.....						7.0	4.2	3.8	3.2	6.1	4.3	3.5
13.....						6.8	4.3	3.6	3.1	6.6	4.6	3.5
14.....						8.5	4.2	3.5	3.0	6.5	5.7	3.5
15.....						11.0	4.1	3.3	2.9	7.4	5.7	3.5
16.....						12.5	4.2	3.3	2.9	7.0	6.0	3.4
17.....						12.3	5.0	3.3	2.9	7.4	5.7	3.3
18.....						12.4	4.8	3.2	2.8	12.2	5.7	3.3
19.....						12.6	5.2	3.2	2.8	10.8	5.8	3.4
20.....						13.7	5.4	3.1	2.8	8.8	6.1	4.2
21.....						14.2	6.4	3.2	3.0	7.8	6.2	5.0
22.....						13.2	6.9	3.2	3.7	7.0	6.8	5.1
23.....						12.0	5.7	3.5	5.2	6.4	6.4	4.9
24.....						11.2	5.2	3.4	4.7	5.8	5.7	4.8
25.....						10.4	5.6	3.2	4.4	5.4	5.2	4.7
26.....						9.3	5.7	3.2	4.0	5.2	5.0	4.6
27.....						8.3	5.9	3.2	3.8	4.8	4.9	4.6
28.....						6.6	5.1	3.5	3.7	4.6	4.7	4.7
29.....						6.3	5.5	3.7	3.7	4.4	4.8	4.5
30.....						5.9	5.1	3.6	3.6	4.3	4.7	4.4
31.....							4.7	3.5		4.6		4.2

1883.

1.....	4.2	4.4	15.0	5.2	4.9	14.1	7.7	5.7	5.4	4.5	8.7	5.7
2.....	4.1	4.3	12.4	5.2	4.6	13.0	7.2	5.5	5.4	4.2	8.3	5.6
3.....	4.0	4.2	11.1	5.2	4.5	16.7	6.7	5.4	5.2	4.0	7.9	5.3
4.....	5.1	4.1	10.3	5.0	4.7	17.3	6.4	6.0	5.0	4.0	7.3	5.2
5.....	6.5	4.3	9.6	4.9	4.8	16.3	6.6	7.5	4.8	4.2	7.0	5.2
6.....	7.0	4.2	8.8	5.9	5.9	15.6	6.4	8.5	4.7	4.6	6.7	7.5
7.....	6.9	4.2	8.3	7.1	7.4	13.8	6.0	8.0	4.7	4.3	6.2	15.9
8.....	5.8	4.2	7.8	7.5	7.2	13.6	5.7	7.5	4.6	4.2	6.2	14.4
9.....	5.2	4.1	7.4	7.9	6.6	14.1	5.6	8.3	4.5	4.2	6.0	14.5
10.....	4.6	4.6	7.3	6.6	5.8	20.9	5.7	10.5	4.4	4.2	6.4	12.8
11.....	4.4	6.3	7.1	5.7	5.6	22.8	5.6	11.8	4.3	7.3	6.9	10.0
12.....	4.3	7.7	6.8	5.5	5.1	22.4	5.5	9.9	4.3	9.5	6.6	8.8

13.....	4.2	8.8	6.5	5.3	4.8	21.4	5.4	8.3	4.2	8.5	6.7	8.0
14.....	4.4	12.2	6.3	5.4	4.6	20.3	5.9	8.2	4.2	8.69	6.2	7.9
15.....	4.5	17.0	6.2	5.3	3.4	17.4	6.7	8.8	4.1	9.3	5.7	7.8
16.....	4.5	19.4	6.0	5.8	4.2	14.3	6.8	8.9	4.0	8.3	5.5	7.6
17.....	4.4	21.8	5.8	5.3	4.1	12.5	12.8	9.0	5.3	7.5	5.4	7.1
18.....	4.4	21.0	5.7	5.1	5.5	11.3	16.2	8.0	5.5	7.7	5.2	6.8
19.....	4.5	20.8	5.6	5.3	6.8	10.3	12.5	7.8	5.2	7.8	5.1	6.6
20.....	4.2	19.5	5.4	5.5	10.7	9.7	10.7	7.5	5.4	13.0	5.0	6.2
21.....	4.0	16.4	5.3	5.3	16.8	9.2	9.8	7.3	5.8	13.0	5.2	6.0
22.....	3.7	13.9	5.2	5.8	17.5	9.4	8.8	7.8	5.5	12.0	6.7	5.8
23.....	3.7	11.9	5.2	5.9	15.9	9.3	8.7	7.4	5.2	10.5	7.8	5.6
24.....	3.8	17.6	5.1	5.9	13.9	9.8	8.2	7.0	5.8	9.5	8.0	5.5
25.....	4.1	21.5	5.0	5.5	11.2	8.9	7.6	6.4	5.5	8.6	8.1	5.5
26.....	4.2	21.6	5.9	5.3	9.7	8.8	7.1	6.2	5.2	8.2	8.2	5.4
27.....	5.0	20.6	5.7	4.8	8.6	8.4	6.7	5.8	4.8	7.8	7.4	5.4
28.....	5.3	18.2	6.4	4.7	7.8	8.3	6.2	5.9	4.6	7.5	6.8	5.3
29.....	5.0	5.8	5.3	7.4	8.6	5.9	5.7	4.3	7.4	6.3	5.2
30.....	4.7	5.5	5.1	11.8	8.3	5.7	5.6	4.1	7.9	8.0	5.2
31.....	4.5	5.2	15.0	5.7	5.5	8.6	5.0

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1884

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	5.0	5.6	8.0	5.6	8.6	6.7	9.7	6.0	5.7	3.7	6.0	5.5
2.....	4.8	5.4	7.8	5.7	14.8	10.0	9.0	5.7	5.7	4.5	5.5	5.2
3.....	4.2	5.5	7.3	6.3	22.2	12.0	8.3	5.4	6.0	5.8	4.7	4.7
4.....	4.1	5.9	7.2	6.6	23.3	10.8	7.8	5.3	5.4	10.6	4.5	4.5
5.....	5.0	6.2	7.0	6.2	22.0	10.8	7.4	5.2	5.0	12.3	4.2	4.4
6.....	5.4	7.0	6.8	6.0	19.8	10.5	7.0	5.0	4.5	11.8	3.8	4.2
7.....	(*)	8.3	6.7	5.8	17.6	9.8	6.7	4.7	4.2	9.1	3.5	3.9
8.....	(*)	9.0	6.9	5.6	13.8	8.9	6.7	4.5	4.0	7.5	3.3	3.7
9.....	(*)	9.4	7.0	5.7	11.0	8.2	6.7	4.2	3.7	6.0	3.5	4.5
10.....	4.8	10.5	6.7	5.5	10.0	7.8	6.7	4.0	3.5	5.0	3.2	8.8
11.....	4.7	17.5	6.3	5.5	9.7	7.8	6.6	3.8	3.2	6.5	3.2	8.8
12.....	(*)	24.7	6.2	5.4	9.0	7.5	6.5	3.7	3.0	5.5	3.0	10.6
13.....	5.0	27.3	6.0	5.6	8.6	7.5	6.4	3.6	3.0	4.7	2.7	13.8
14.....	4.6	27.9	5.9	5.7	8.3	7.3	6.2	3.6	2.9	4.0	2.6	15.6
15.....	4.7	27.5	5.7	6.3	9.6	7.3	6.1	4.0	2.9	3.7	2.4	14.9
16.....	4.6	23.8	5.6	6.6	10.3	7.8	5.8	4.2	2.7	3.4	2.2	13.3
17.....	4.8	18.5	5.4	6.4	9.7	7.7	5.7	4.8	2.8	3.2	2.3	11.4
18.....	4.7	16.0	5.3	5.7	9.0	7.8	5.7	4.3	3.5	3.7	2.7	9.8
19.....	4.8	14.0	5.3	5.7	9.6	7.3	5.7	5.0	4.3	3.6	3.7	8.8
20.....	4.8	14.9	5.2	5.6	9.7	7.0	5.8	5.7	4.2	3.3	4.6	7.7
21.....	4.3	15.2	5.3	7.0	9.0	7.0	6.0	5.2	4.4	3.2	4.7	6.7
22.....	4.6	14.8	5.2	7.7	8.7	6.8	5.7	5.7	3.0	3.2	5.0	6.7
23.....	4.7	13.3	5.2	7.6	9.5	6.4	5.7	5.3	2.9	3.2	6.0	6.0
24.....	4.6	11.3	5.3	9.0	9.5	6.7	6.4	5.7	3.2	7.5	8.0	5.7
25.....	3.7	10.2	5.2	10.0	8.3	6.5	6.4	6.0	3.2	8.5	8.8	4.6

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26.....	3.5	9.3	7.3	10.3	8.3	7.4	6.7	6.2	3.2	8.0	3.8
27.....	3.9	9.0	7.0	9.6	8.2	8.2	7.2	5.4	3.2	5.8	3.6
28.....	4.2	8.6	6.7	9.0	7.8	7.8	7.1	5.6	2.9	5.3	9.0	5.9
29.....	4.7	8.3	6.5	8.4	7.5	9.5	6.8	5.6	2.8	7.0	8.3	13.2
30.....	4.6	.....	6.2	8.5	7.4	9.1	6.7	5.3	3.0	7.8	7.3	15.1
31.....	5.0	.....	5.8	.....	7.2	.....	6.5	5.3	.....	7.0	.....	17.6

*Frozen.

1885.

1.....	18.5	7.2	12.3	7.3	17.2	14.0	12.3	6.1	4.8	4.1	3.4	2.6
2.....	17.5	8.5	13.5	6.2	16.0	12.8	11.0	6.1	4.5	4.0	3.4	2.6
3.....	14.8	9.3	12.8	6.9	13.3	12.0	10.4	6.1	4.2	3.9	3.2	2.6
4.....	11.8	10.3	12.6	10.1	12.7	11.0	10.2	6.2	4.0	3.9	3.3	2.6
5.....	10.0	13.4	12.7	12.7	12.7	10.3	12.8	6.3	5.0	3.7	3.5	2.6
6.....	9.6	14.3	12.6	12.1	12.2	10.6	17.6	6.1	4.9	3.9	3.5	2.6
7.....	9.7	14.7	10.9	11.9	11.5	8.9	20.9	6.0	4.8	4.0	3.6	2.8
8.....	10.6	15.2	10.2	12.5	11.0	8.3	20.4	6.5	5.0	4.2	3.4	2.9
9.....	10.8	15.2	9.6	11.0	10.8	8.3	19.9	7.0	10.5	4.0	3.3	2.9
10.....	11.3	14.4	8.9	9.4	10.5	7.3	19.0	6.8	13.0	3.8	3.2	2.8
11.....	11.4	12.8	8.0	8.8	10.0	7.8	18.6	6.3	15.5	3.6	3.0	2.7
12.....	11.0	10.9	8.1	8.3	9.5	9.6	17.8	6.0	17.0	3.2	3.0	2.7
13.....	10.9	9.7	9.8	7.6	8.8	10.6	16.8	6.0	17.5	3.2	3.5	2.7
14.....	10.8	9.2	10.6	7.2	8.5	10.0	17.3	6.7	15.5	2.8	3.3	2.7
15.....	10.7	7.8	10.0	6.7	8.8	10.4	18.3	7.0	10.1	3.0	3.2	2.6
16.....	11.7	7.2	10.7	6.7	8.8	9.4	18.3	8.2	13.0	2.7	3.0	2.2
17.....	11.8	6.7	11.1	6.5	9.2	9.8	15.9	7.9	14.1	2.8	2.9	2.5
18.....	10.2	6.3	9.9	6.2	12.0	10.6	13.1	6.3	14.0	2.7	2.9	2.3
19.....	9.1	6.1	8.8	6.5	16.5	10.2	11.0	6.1	13.6	3.0	2.8	2.1
20.....	8.4	6.0	8.0	7.2	19.2	9.8	10.2	5.5	10.7	3.1	2.7	2.1
21.....	7.4	5.8	7.6	7.2	19.1	8.4	9.2	5.2	8.1	2.8	2.7	2.1
22.....	6.8	5.6	7.4	10.0	18.8	8.3	9.0	5.1	6.5	2.8	2.6	2.1
23.....	6.2	5.6	7.3	27.3	18.7	13.0	9.7	5.2	5.8	2.8	2.6	2.2
24.....	6.2	6.0	7.6	27.4	18.6	14.1	8.7	5.0	5.4	2.8	2.5	2.3
25.....	6.4	8.2	7.5	27.6	17.6	13.8	8.2	5.0	5.0	2.8	2.5	2.4
26.....	6.5	10.2	7.6	27.9	17.3	14.3	7.9	4.9	4.6	2.9	2.5	2.4
27.....	6.9	10.7	7.4	26.6	18.0	17.1	7.6	4.5	4.4	3.3	2.5	3.6
28.....	7.2	10.8	7.6	24.6	18.2	17.1	7.3	4.3	4.0	3.4	2.6	3.5
29.....	7.2	7.6	21.2	15.7	15.0	7.0	4.9	4.4	3.3	2.5	4.4
30.....	7.4	7.5	18.3	14.0	13.5	6.6	6.0	4.2	3.2	2.5	5.0
31.....	7.5	7.5	14.3	6.2	5.5	3.1	4.8

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1886

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.6	3.2	6.7	7.4	9.8	3.2	5.4	4.6	2.5	3.2	1.5	1.1
2.....	4.4	3.7	6.5	6.8	8.3	2.9	5.3	7.7	2.5	3.0	1.4	1.2
3.....	4.2	4.0	6.5	6.8	7.3	2.9	5.0	6.9	2.6	3.0	1.5	1.2
4.....	4.1	5.0	6.4	7.0	6.6	2.9	4.8	7.1	2.9	2.6	1.4	1.5
5.....	4.7	5.1	6.3	6.7	6.0	2.7	4.6	7.9	3.6	2.5	1.3	1.5

6.....	4.2	5.5	6.3	6.5	5.5	2.6	4.3	10.4	3.5	2.4	1.3	1.0
7.....	4.0	4.4	6.3	6.4	5.5	2.9	3.9	10.4	3.4	2.3	1.2	.8
8.....	3.8	4.4	6.2	6.3	5.5	2.9	3.8	12.2	6.4	2.2	1.2	.8
9.....	(*)	5.1	6.8	6.2	5.3	3.0	3.5	13.7	7.0	2.1	1.2	.9
10.....	(*)	6.3	8.8	6.8	5.2	3.9	3.8	13.0	6.8	2.0	1.2	.9
11.....	(*)	9.5	9.2	7.7	6.5	4.3	3.2	12.5	7.0	2.0	1.3	1.0
12.....	(*)	13.0	9.0	8.0	8.5	4.5	3.0	12.0	5.6	1.8	1.3	1.1
13.....	(*)	14.8	9.0	7.7	8.7	4.5	3.0	10.8	4.5	1.8	1.2	1.2
14.....	(*)	14.9	8.9	7.2	7.5	5.3	3.0	10.2	5.7	1.7	1.2	1.1
15.....	(*)	13.4	8.4	7.5	6.5	5.9	2.8	7.2	8.7	1.7	1.1	1.1
16.....	(*)	11.8	7.9	9.4	5.7	5.7	2.6	6.5	6.7	1.6	1.1	1.2
17.....	3.7	11.0	7.4	10.1	5.6	5.2	2.6	6.0	6.0	1.5	1.2	1.1
18.....	(*)	10.3	7.1	11.3	5.1	4.9	2.6	5.4	6.4	1.4	1.1	1.1
19.....	(*)	9.5	6.8	12.9	4.9	4.9	2.2	5.0	6.0	1.4	1.1	1.1
20.....	(*)	9.0	6.5	11.3	5.0	4.7	2.0	4.6	5.4	1.4	1.1	1.3
21.....	(*)	8.7	6.1	10.0	5.8	5.5	2.0	4.3	5.2	1.6	1.1	1.4
22.....	(*)	8.5	5.8	8.8	5.3	5.1	1.9	4.0	4.4	1.5	1.2	1.5
23.....	(*)	8.2	5.5	7.7	4.5	4.9	1.8	3.8	4.2	1.5	1.3	1.5
24.....	(*)	7.9	5.4	7.0	4.5	5.5	1.7	3.6	4.0	1.7	2.4	1.6
25.....	(*)	7.7	5.2	6.1	4.1	6.4	1.7	3.4	3.8	1.8	2.0	1.6
26.....	(*)	7.4	5.0	6.6	4.0	6.6	1.8	3.3	3.6	1.8	1.5	1.6
27.....	(*)	7.1	4.9	6.8	4.0	6.0	1.9	3.1	3.2	1.8	1.3	1.6
28.....	(*)	6.9	4.8	10.1	3.8	5.7	1.8	2.9	3.1	1.6	1.3	1.4
29.....	(*)	.....	4.7	10.8	3.5	5.7	2.2	3.0	3.9	1.5	1.1	1.0
30.....	(*)	.....	5.6	11.5	3.3	5.5	5.0	2.8	3.7	1.7	.....	.9
31.....	(*)	.....	7.4	.....	3.3	.....	4.5	2.7	.....	1.7	.....	.9

*Frozen.

1887.

1.....	.9	1.8	2.4	1.6	4.4	5.5	5.8	2.1	1.7	.....	.....	.....
2.....	.9	1.6	2.4	1.5	4.0	5.3	5.0	1.9	2.8	.....	.....	.....
3.....	(*)	1.5	2.4	1.5	4.0	5.5	4.5	1.8	2.4	.....	.....	.....
4.....	(*)	1.2	2.3	1.4	5.4	5.1	4.3	2.0	2.3	.....	.....	.....
5.....	(*)	.3	2.2	1.3	7.6	5.0	4.2	2.0	2.2	.....	.....	.....
6.....	(*)	.0	2.3	1.3	8.3	4.9	5.7	1.8	2.0	.....	.....	.....
7.....	(*)	.6	4.1	1.1	9.0	4.6	5.5	1.6	4.1	.....	.....	.....
8.....	(*)	1.3	4.5	1.0	8.4	4.8	5.2	1.5	4.2	.....	.....	.....
9.....	(*)	2.0	4.6	.8	6.4	5.8	6.5	1.4	4.0	.....	.....	.....
10.....	(*)	2.4	4.6	.7	4.2	5.8	7.0	1.3	4.0	.....	.....	.....
11.....	(*)	2.6	5.6	.5	4.1	5.8	6.8	1.2	4.5	.....	.....	.....
12.....	.8	2.4	5.4	.5	3.7	6.0	5.4	1.0	4.2	.....	.....	.....
13.....	.8	2.6	4.8	.5	3.6	6.8	5.2	.9	3.8	.....	.....	.....
14.....	.8	4.0	4.6	.5	3.5	6.7	5.2	.8	3.7	.....	.....	.....
15.....	.7	5.6	4.4	.4	3.3	7.8	4.7	.7	3.2	.....	.....	.....
16.....	.7	6.3	3.8	.4	3.2	8.8	4.6	.9	.....	.....	.....	.....
17.....	.6	6.3	3.6	.4	3.2	9.2	4.4	1.1	.....	.....	.....	.....
18.....	.7	4.4	3.2	.4	3.5	9.3	3.7	1.0	.....	.....	.....	.....
19.....	.7	3.9	2.9	.5	4.9	9.2	3.4	.9	.....	.....	.....	.....
20.....	.7	3.7	2.8	1.6	4.6	8.6	3.2	1.2	.....	.....	.....	.....
21.....	.7	3.3	2.7	3.0	4.6	7.3	3.1	1.3	.....	.....	.....	.....
22.....	.9	3.0	2.5	2.6	4.6	6.2	3.0	1.5	.....	.....	.....	.....

23.....	1.2	2.8	2.4	2.4	4.6	5.8	2.9	1.6	.....	.....	.....	.....
24.....	1.2	2.8	2.3	3.6	4.5	5.6	2.7	1.4	.....	.....	.....	.....
25.....	1.1	2.8	2.2	3.8	4.7	5.4	2.5	1.2	.....	.....	.....	.....
26.....	1.1	2.9	2.2	3.5	6.2	4.8	2.3	1.4	.....	.....	.....	.....
27.....	1.1	2.9	2.0	5.3	7.6	4.8	2.4	1.5	.....	.....	.....	.....
28.....	1.3	2.5	1.8	5.6	6.6	4.4	2.7	1.5	.....	.....	.....	.....
29.....	2.0	.....	1.7	4.6	6.5	4.4	2.7	1.6	.....	.....	.....	.....
30.....	1.8	.....	1.7	4.4	5.5	6.8	2.6	1.6	.....	.....	.....	.....
31.....	1.8	.....	1.7	.....	5.8	.....	2.3	1.7	.....	.....	.....	.....

*Frozen.

348 C.—Water-gauge readings at Little Rock, Ark., from 1879 to 1887.

1879.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.3	1.1	1.4	—8	—6	1.4
2.....	2.1	1.2	1.0	—8	—6	1.9
3.....	2.0	1.2	1.0	—7	—6	2.0
4.....	2.0	1.1	1.0	—7	—6	1.8
5.....	1.1	1.0	.9	—6	—6	1.5
6.....	2.1	1.0	.7	—7	—6	1.5
7.....	4.4	1.1	.7	—8	—6	1.4
8.....	4.4	1.1	.5	—8	—6	1.4
9.....	5.2	1.6	.5	—8	—6	1.3
10.....	5.0	1.5	.5	—8	—6	1.5
11.....	4.5	1.6	.4	—8	—6	2.8
12.....	3.1	1.9	.4	—9	—6	3.7
13.....	3.2	2.0	.4	—9	—6	3.9
14.....	2.8	2.4	.4	—9	—5	5.1
15.....	2.3	2.5	.4	—9	—5	5.6
16.....	1.1	2.1	.4	—9	—3	4.8
17.....	1.9	1.6	.4	—9	—3	4.0
18.....	1.8	1.5	.5	—9	—3	3.2
19.....	1.6	1.8	.5	—9	—3	3.0
20.....	1.6	2.0	.5	—9	—3	2.8
21.....	1.5	2.1	.5	—9	—0	2.4
22.....	1.2	2.0	—3	—9	—4	2.1
23.....	1.1	2.6	—3	—8	1.0	1.9
24.....	1.0	4.7	—5	—5	1.7	2.0
25.....	1.0	5.7	—7	—3	2.1	5.0
26.....	1.1	5.1	—7	—3	2.1	6.8
27.....	1.3	3.7	—7	—3	2.0	6.4
28.....	1.0	2.7	—7	—3	1.5	5.4
29.....	1.0	2.3	—7	—4	1.4	4.5
30.....	1.0	1.9	—8	—4	1.2	4.5
31.....	1.0	1.8	.....	—5	.....	4.9

1880.

1.....	5.1	2.9	9.3	5.0	6.3	1.9	.9	3.7	.9	.3	.0	1.6
2.....	4.8	3.7	9.1	5.1	5.4	2.5	.8	2.7	.7	.3	.0	1.8
3.....	4.4	3.5	9.7	5.1	4.5	2.9	1.3	2.6	1.0	.3	.2	2.0
4.....	4.3	3.2	11.5	5.3	4.5	3.9	2.1	2.6	3.0	.3	.3	2.1
5.....	4.5	2.9	13.1	5.1	4.3	4.5	2.6	2.9	3.5	.1	.4	2.3
6.....	4.9	2.5	13.3	4.8	3.6	5.0	3.0	3.0	2.6	.1	.5	2.6
7.....	7.1	2.3	13.5	7.4	3.1	4.8	3.0	4.1	3.0	.1	.5	2.3
8.....	6.9	2.1	13.3	8.6	2.9	4.5	3.3	4.1	3.1	.0	.2	2.0
9.....	6.0	2.1	12.6	10.1	2.5	4.3	5.2	3.1	2.8	.0	.2	1.9
10.....	5.6	2.6	12.4	8.4	2.3	3.5	5.8	2.7	2.3	.2	.5	1.7
11.....	5.9	2.6	12.6	7.1	2.1	3.0	5.6	2.5	2.1	.2	1.9	1.5
12.....	6.4	3.1	12.7	6.0	2.0	2.9	5.7	2.8	2.1	.3	3.3	1.3
13.....	6.5	7.3	14.0	5.2	1.8	3.0	6.0	2.6	1.9	.5	3.5	1.0
14.....	6.8	8.5	14.7	4.6	1.6	4.0	6.5	2.8	1.7	.5	3.5	1.0
15.....	6.4	11.8	14.4	4.1	1.4	4.2	6.5	2.9	1.7	.4	1.8	.9
16.....	5.7	12.0	13.9	3.9	2.5	3.5	5.8	2.2	1.5	.2	1.5	.8
17.....	5.0	12.0	13.3	3.9	3.5	3.0	5.1	2.0	1.5	.2	1.2	.7
18.....	4.5	11.5	12.5	4.8	3.1	2.6	4.8	1.9	1.0	.2	.7	.9
19.....	4.0	10.4	11.5	4.9	2.9	2.3	3.7	1.7	1.0	.5	.5	.9
20.....	3.7	9.4	10.6	5.1	3.1	2.0	3.4	1.7	.9	.5	.5	.7
21.....	3.5	8.3	9.8	6.9	2.9	.9	3.0	1.5	.5	.5	.4	1.0
22.....	3.1	7.8	9.0	7.5	1.7	.1	2.7	1.3	.4	.5	.4	1.0
23.....	2.9	7.0	8.4	6.7	1.5	1.1	2.5	1.2	.4	.3	.2	.8
24.....	2.6	6.4	7.8	6.2	1.2	1.0	2.2	1.1	.2	.3	.1	.7
25.....	2.5	5.7	7.0	5.7	1.5	.9	2.0	1.0	.9	.3	.3	.7
26.....	2.2	5.2	6.4	5.5	1.1	.6	2.0	1.0	.8	.1	.2	.6
27.....	2.0	4.9	6.0	5.8	1.0	.4	1.8	1.0	.8	.2	.3	.5
28.....	1.9	6.4	6.0	5.3	.8	.3	1.6	.9	.8	.2	.5	.5
29.....	1.8	8.4	5.7	5.2	.5	1.7	1.6	1.0	.7	.2	1.0	.5
30.....	1.7	5.3	6.3	.4	1.2	3.1	1.3	.3	.2	1.9	(*)
31.....	1.9	5.18	4.0	1.02	(*)

*Frozen

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1881.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	(*)	5.0	16.4	9.0	7.0	13.5	11.0	3.9	.2	.5	6.4	5.1
2.....	(*)	5.0	15.7	8.5	6.8	13.3	12.6	3.8	.8	1.2	6.4	4.7
3.....	(*)	5.0	14.9	8.3	6.6	13.0	12.5	2.7	.9	1.4	5.5	4.5
4.....	(*)	5.2	14.5	7.7	6.5	12.8	12.7	2.6	1.0	2.2	5.0	4.0
5.....	(*)	6.0	14.1	7.3	6.5	12.5	13.5	2.6	1.2	4.0	4.5	4.0
6.....	3.0	6.5	13.7	7.2	6.1	12.0	12.0	2.4	1.1	9.8	4.5	4.0
7.....	2.9	8.5	12.2	7.0	7.5	11.5	10.5	2.5	1.0	9.8	4.3	3.6
8.....	2.9	13.0	11.8	6.8	9.0	10.6	9.1	2.5	.9	11.5	4.2	3.5

9	2.7	14.0	11.7	6.7	9.9	10.2	8.2	2.8	.5	11.5	4.1	3.3
10	2.5	14.2	12.3	6.7	14.6	9.2	7.5	3.7	.5	11.4	3.8	3.2
11	2.5	15.5	12.5	6.5	15.8	8.7	7.0	4.3	.5	11.0	3.7	3.0
12	3.0	16.5	12.3	6.5	15.6	8.1	6.5	4.5	.5	8.9	3.5	2.9
13	3.0	17.0	12.1	8.0	15.4	7.8	6.3	3.4	.4	8.0	3.8	2.8
14	2.9	16.0	10.5	9.0	14.8	7.5	6.1	2.8	.3	7.8	4.3	3.2
15	2.7	14.5	9.8	9.1	14.5	7.2	6.0	2.5	.1	7.0	7.2	3.9
16	2.5	13.5	9.5	9.5	12.4	7.0	5.7	2.2	.0	6.8	8.2	6.0
17	2.7	12.5	10.0	9.9	12.0	6.8	5.4	2.0	.0	6.6	8.5	6.5
18	2.7	11.7	10.8	8.5	10.4	6.5	5.4	1.8	.5	6.5	8.5	6.8
19	4.0	17.7	10.4	7.6	9.6	6.3	5.2	1.5	1.5	6.2	9.0	6.5
20	6.9	20.1	10.1	7.1	8.9	6.1	4.9	1.3	2.4	5.2	10.2	5.6
21	7.5	19.4	9.8	6.9	8.5	6.5	4.7	1.0	2.7	4.0	10.9	5.5
22	7.5	19.1	9.7	6.8	10.7	6.4	4.5	.9	1.7	4.0	11.0	5.5
23	7.5	18.9	10.0	6.7	12.6	6.3	4.5	.5	1.5	3.7	9.1	5.6
24	7.1	18.5	10.8	6.5	13.2	6.2	4.2	.5	1.5	3.5	10.2	8.8
25	6.6	17.9	11.1	7.4	14.3	6.5	4.0	.4	1.2	6.4	11.4	10.9
26	6.5	15.7	11.3	7.8	15.6	6.0	3.9	.4	1.2	7.5	10.5	11.0
27	5.8	15.5	11.5	8.0	17.3	6.2	3.9	.4	.5	8.0	9.1	10.4
28	5.4	15.9	11.5	8.3	17.0	6.4	4.0	.3	.2	8.5	7.9	9.5
29	5.2		10.9	7.8	16.0	6.9	4.0	.2	.0	6.9	7.1	8.4
30	5.1		10.0	7.4	15.1	7.4	4.0	.2	.0	6.3	6.2	7.7
31	4.8		9.5		14.3		4.0	.2		5.5		6.7

*Frozen.

1882.

1	6.0	7.0	18.9	8.6	3.9	16.5	6.4	4.9	1.4	1.9	4.6	4.3
2	5.4	6.9	17.6	8.7	4.3	17.7	5.9	4.4	1.4	1.8	4.1	4.0
3	5.1	7.2	16.5	8.0	4.5	17.9	5.6	3.5	1.5	1.8	4.0	3.9
4	4.7	7.5	15.5	7.5	5.0	17.0	5.5	3.1	1.6	2.4	4.3	3.7
5	4.4	7.7	15.0	7.0	5.0	16.5	5.1	3.0	1.5	2.5	4.0	3.5
6	4.2	7.0	14.9	6.9	4.9	15.3	4.5	3.0	1.5	4.1	3.7	3.3
7	3.9	6.6	14.4	6.5	6.1	13.8	4.1	2.9	1.5	5.4	3.6	3.1
8	3.9	7.5	14.0	6.2	8.9	12.0	4.0	3.0	1.3	4.7	4.1	3.0
9	3.5	10.3	13.5	6.0	14.5	11.0	3.7	3.0	1.3	3.8	4.5	2.8
10	3.4	13.0	13.4	5.9	21.8	9.6	3.5	3.0	1.3	3.1	4.7	2.8
11	3.4	13.8	13.3	5.5	22.7	8.9	3.3	2.9	1.3	3.6	5.5	2.5
12	6.4	14.1	13.8	5.3	22.5	8.1	3.7	2.9	1.3	4.0	5.5	2.4
13	8.2	14.5	14.4	5.2	22.1	7.5	3.9	2.9	1.3	3.8	6.2	2.3
14	10.2	14.9	14.0	5.0	21.5	7.0	3.9	2.8	1.1	4.2	7.0	2.2
15	11.5	14.6	14.0	5.1	20.2	7.0	3.7	2.7	1.1	5.3	6.3	2.1
16	11.7	14.2	13.7	5.3	17.2	7.3	3.3	2.6	1.1	6.0	6.0	1.9
17	12.0	17.5	12.7	5.6	15.0	9.2	3.1	2.4	1.0	6.9	6.0	1.9
18	12.2	19.8	11.7	6.0	12.7	11.9	3.0	2.3	1.0	8.5	6.0	1.8
19	12.2	19.3	11.3	5.7	10.9	12.5	3.0	2.0	1.0	8.7	6.2	1.7
20	10.7	19.0	10.9	5.1	9.5	12.2	3.6	2.0	1.0	9.9	6.3	1.7
21	9.5	21.5	10.0	4.8	8.6	12.1	3.8	1.9	1.0	10.9	6.5	3.2
22	9.7	22.5	10.2	4.7	8.0	12.8	3.8	1.8	.9	9.5	7.0	5.6
23	9.9	22.9	11.0	4.7	7.8	13.4	4.1	1.7	.9	8.3	7.1	7.1
24	9.6	*23.5	12.2	4.5	7.5	13.0	4.5	1.9	.9	7.3	7.2	7.2

25.....	9.3	23.5	11.7	4.5	7.8	11.9	5.8	1.7	1.0	6.5	7.2	7.2
26.....	9.3	22.8	11.0	4.4	8.0	10.8	5.1	1.7	1.0	5.7	7.2	6.2
27.....	7.9	21.0	9.7	4.0	7.9	10.0	4.7	1.6	2.3	5.0	6.2	5.6
28.....	7.7	20.0	9.2	4.7	7.5	9.1	4.3	1.5	2.6	4.5	5.4	5.4
29.....	7.3	.....	8.6	4.8	9.5	8.0	4.5	1.5	2.5	4.2	5.0	4.8
30.....	7.3	.....	8.5	4.5	11.9	7.0	4.8	1.4	1.9	4.4	4.5	4.5
31.....	7.5	.....	8.5	.....	13.3	.....	4.8	1.4	.....	5.5	.....	4.3

*23 feet is the danger line.

350

1883.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	4.1	8.7	21.6	7.9	8.9	11.0	7.8	(*)	4.0	3.5	7.5	7.7
2.....	3.8	7.5	20.4	7.9	8.4	15.1	7.9	.....	3.9	3.5	7.4	6.9
3.....	3.7	6.5	18.4	7.4	7.8	15.6	7.6	.....	3.8	3.8	8.3	6.5
4.....	3.7	6.1	16.4	6.5	7.1	15.2	7.5	.....	3.6	3.9	8.7	6.0
5.....	7.9	7.4	14.5	6.4	6.5	17.2	6.5	.....	3.6	3.6	8.5	5.9
6.....	10.2	8.0	12.9	8.9	6.2	18.7	6.0	.....	3.6	3.6	7.9	5.7
7.....	10.5	7.7	12.0	12.8	6.3	18.0	5.7	.....	3.4	3.4	7.3	6.9
8.....	10.9	7.6	11.0	13.6	6.3	15.7	5.3	.....	3.2	3.1	6.9	16.0
9.....	10.4	6.7	10.1	13.0	6.3	14.0	5.3	.....	3.0	3.0	6.3	17.5
10.....	9.3	6.4	9.0	12.5	7.7	15.0	5.3	.....	2.9	3.0	5.9	16.8
11.....	8.5	6.8	8.6	12.0	7.6	16.2	5.0	.....	2.7	3.0	5.8	16.1
12.....	7.9	9.8	8.3	11.0	7.0	20.5	5.0	.....	2.8	3.0	6.9	14.9
13.....	6.9	12.9	7.9	9.6	6.5	21.9	4.9	.....	2.8	3.0	7.5	13.0
14.....	6.5	15.2	7.7	8.0	6.3	22.5	4.7	.....	2.8	5.5	8.0	11.5
15.....	6.4	15.8	7.3	8.0	5.0	22.0	4.5	.....	2.8	8.7	7.9	10.1
15.....	6.2	17.8	7.0	8.1	4.7	20.9	4.5	.....	2.8	8.7	7.0	9.3
17.....	6.2	21.0	6.7	8.4	4.4	19.5	4.5	.....	2.8	8.5	6.4	8.9
18.....	6.2	22.7	6.5	8.1	4.2	17.5	4.9	.....	2.8	9.0	5.8	8.5
19.....	6.0	22.9	6.2	7.5	4.0	15.5	7.0	.....	2.8	9.0	5.5	8.1
20.....	5.6	22.6	6.0	6.9	4.4	12.8	(*)	.....	2.8	8.9	5.1	7.9
21.....	5.0	21.4	5.9	6.9	5.9	11.5	.....	.....	2.8	10.0	5.0	7.3
22.....	4.8	19.5	5.5	8.5	10.0	10.5	.....	.....	2.9	11.0	4.9	6.9
23.....	4.5	18.0	5.5	9.0	16.0	9.3	.....	.....	4.2	13.5	8.5	6.5
24.....	4.0	16.8	5.5	8.7	17.0	8.5	.....	.....	4.5	13.0	10.5	6.1
25.....	3.4	17.8	5.0	8.5	16.0	8.5	.....	.....	4.2	12.5	9.8	6.0
26.....	3.0	21.4	5.4	8.1	15.2	8.8	.....	.....	4.6	10.5	9.0	6.0
27.....	3.0	22.3	5.1	7.7	13.0	8.8	.....	.....	4.7	9.5	9.0	6.0
28.....	5.5	22.3	4.9	7.4	9.0	8.7	.....	.....	4.7	8.7	9.0	5.9
29.....	7.5	.....	4.9	7.3	8.9	8.1	.....	.....	4.2	8.4	9.0	5.6
30.....	8.5	.....	6.4	8.5	8.5	7.9	.....	4.3	3.9	8.9	8.5	5.9
31.....	8.7	.....	7.5	.....	8.3	.....	.....	4.2	.....	7.8	.....	6.5

*Gauge broken and rendered useless.

†Zero of gauge changed to 9 inches above low water of 1879.

1884.

1.....	5.9	4.3	12.0	9.5	13.4	9.0	8.7	8.0	5.6	4.4	6.3	9.2
2.....	5.7	4.5	11.5	9.0	14.9	8.5	9.9	7.9	5.5	4.1	6.5	9.1
3.....	5.5	4.9	11.0	8.7	16.9	8.5	10.4	7.5	5.5	3.9	7.2	7.0
4.....	5.5	5.3	10.7	8.3	20.7	8.5	10.5	7.0	5.5	3.9	6.5	6.3
5.....	5.0	5.5	10.3	8.2	23.3	9.9	9.7	6.5	5.4	4.5	5.8	5.8
6.....	4.3	8.4	10.0	8.1	23.8	12.0	9.0	6.0	6.6	7.0	5.4	5.5
7.....	(*)	14.6	9.9	8.5	23.0	11.2	8.6	5.7	6.2	11.3	5.2	5.3
8.....		16.8	10.0	8.4	22.0	11.5	8.0	5.7	6.2	12.4	4.9	5.3
9.....		17.2	10.1	8.0	20.7	11.5	7.6	5.5	6.0	11.5	4.7	6.0
10.....		17.5	10.4	7.6	19.0	11.0	7.5	5.2	5.0	10.0	4.3	5.4
11.....		19.2	10.3	7.5	16.5	10.5	7.3	5.0	4.4	8.4	4.5	6.5
12.....		24.2	10.0	7.5	14.5	9.1	7.0	4.8	4.0	7.0	4.5	9.5
13.....		25.7	9.7	7.9	13.3	8.6	7.0	4.4	4.0	5.9	4.5	13.3
14.....	4.3	26.1	9.2	8.5	12.2	8.5	7.0	4.4	3.9	6.0	4.0	14.3
15.....	4.7	26.2	8.9	10.0	11.3	8.2	6.9	4.4	3.1	5.8	3.9	15.9
16.....	4.8	26.3	8.5	12.4	10.5	8.1	6.8	4.2	3.5	5.2	3.5	17.6
17.....	5.3	25.9	8.2	12.0	10.4	8.0	6.5	4.2	3.5	4.5	3.5	17.3
18.....	5.4	24.5	8.0	11.3	11.5	8.0	6.5	4.0	3.7	4.3	3.5	14.8
19.....	5.4	23.1	8.0	11.0	11.8	8.4	6.5	4.5	3.8	4.0	3.5	13.2
20.....	5.5	21.8	7.9	11.0	11.4	8.5	7.0	5.0	4.3	3.6	3.3	11.7
21.....	5.5	20.5	7.9	11.0	11.0	8.4	7.2	5.0	4.1	3.6	3.5	11.0
22.....	5.4	19.5	7.7	10.8	11.3	8.0	6.9	4.9	4.0	3.6	3.5	9.7
23.....	5.4	19.1	7.5	11.5	11.4	7.9	6.6	4.9	4.5	3.6	4.4	8.7
24.....	5.0	18.5	7.5	12.5	11.1	7.8	6.6	6.0	4.4	3.5	4.8	8.0
25.....	4.8	17.5	8.9	12.0	10.5	7.5	6.5	6.4	4.0	3.5	5.7	7.4
26.....	4.5	16.0	10.1	12.0	11.5	7.5	6.3	6.0	3.9	3.5	6.6	7.0
27.....	4.9	14.7	10.8	12.9	11.5	7.7	6.6	5.8	3.7	5.3	7.5	6.5
28.....	4.4	14.5	11.1	13.6	10.4	8.2	7.0	6.3	3.6	7.9	8.4	9.6
29.....	3.9	12.8	11.3	13.9	9.9	8.5	7.1	6.4	4.4	7.4	8.7	17.9
30.....	3.9		10.6	13.8	9.5	8.7	8.3	6.0	4.5	6.3	9.0	21.2
31.....	4.0		10.0		9.3		8.6	5.7		6.7		22.9

*Frozen.

351

1885.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	23.3	8.9	14.4	8.8	23.5	16.0	16.3	7.6	5.1	4.8	3.6	2.9
2.....	22.9	8.6	15.0	8.8	22.4	15.3	15.0	7.3	6.0	4.3	3.5	2.9
3.....	22.5	8.6	15.4	9.5	21.3	15.1	13.9	7.1	6.0	4.7	3.4	2.9
4.....	21.3	9.0	15.6	10.0	19.7	14.3	12.7	7.0	5.8	4.3	3.4	2.9
5.....	19.5	10.0	15.3	10.5	17.9	13.3	11.6	7.0	5.2	3.9	3.7	2.8
6.....	18.2	11.2	14.8	11.2	16.8	12.8	11.2	7.0	4.9	4.2	3.8	2.8
7.....	16.6	11.0	14.5	13.5	15.8	11.9	12.2	7.0	4.8	4.2	4.0	2.8
8.....	15.5	15.0	13.8	14.3	15.0	10.9	18.2	7.1	5.1	4.0	4.1	2.8
9.....	14.6	15.2	12.9	14.3	14.3	10.2	20.2	7.0	5.8	4.0	4.2	2.9
10.....	14.0	15.0	11.9	14.3	13.5	9.9	20.4	6.8	6.0	4.4	4.0	3.0
11.....	14.3	15.5	11.0	14.8	13.0	9.5	20.0	6.8	6.0	4.6	3.9	3.1
12.....	14.3	15.2	9.5	15.2	12.6	9.2	19.7	7.3	11.4	4.7	3.8	3.1

13.....	14.2	14.0	9.8	12.5	12.2	9.0	19.2	7.3	15.0	4.4	3.7	3.1
14.....	13.5	12.8	9.5	11.4	11.7	9.6	18.3	6.8	16.8	4.2	3.6	3.1
15.....	13.5	11.8	10.7	10.5	11.3	10.8	17.8	6.6	17.1	4.1	3.5	3.1
16.....	13.5	10.4	11.8	9.9	10.5	11.1	18.0	6.6	15.9	3.9	3.5	3.0
17.....	13.5	9.8	11.7	9.3	10.1	11.1	18.4	6.8	14.0	3.8	3.6	3.0
18.....	13.0	9.0	11.5	8.8	9.7	10.8	18.5	7.2	13.0	3.8	3.6	3.0
19.....	14.0	8.4	11.8	8.3	10.5	10.4	17.1	8.0	14.0	3.7	3.4	2.9
20.....	13.3	7.8	11.6	8.2	12.0	11.0	15.0	8.2	14.3	3.6	3.3	2.9
21.....	13.0	7.6	11.6	8.1	17.0	11.4	12.7	7.5	14.0	3.5	3.2	2.8
22.....	11.0	7.2	10.3	7.6	19.4	11.0	11.3	6.8	12.5	3.5	3.1	2.8
23.....	10.5	6.8	9.5	7.9	19.9	10.4	10.6	6.5	10.2	3.5	3.1	2.8
24.....	9.4	6.4	9.0	10.6	19.7	9.4	9.9	6.0	8.4	3.5	3.0	2.8
25.....	8.8	6.0	8.7	23.2	19.5	10.9	10.0	5.9	7.7	3.4	3.0	2.8
26.....	8.3	8.0	8.7	25.1	19.4	14.5	10.0	5.8	6.8	3.3	3.0	2.7
27.....	8.0	10.2	9.5	25.4	18.8	14.8	9.3	5.8	6.0	3.3	3.0	2.7
28.....	8.0	12.9	9.7	25.8	18.9	15.2	8.8	5.5	5.9	3.3	2.9	2.7
29.....	8.4	.....	9.7	25.7	19.1	17.5	8.6	5.4	5.8	3.3	2.9	2.7
30.....	8.6	.....	9.7	25.4	18.5	17.3	8.3	5.3	5.3	3.3	2.9	3.0
31.....	8.8	.....	9.3	.....	17.3	.....	8.0	5.1	.....	3.5	.....	3.5

1886.

1.....	3.8	4.5	8.9	9.9	11.0	3.5	6.0	4.5	2.7	5.0	1.3	3.3
2.....	4.5	4.5	8.5	9.9	11.5	3.3	5.8	5.3	2.6	4.5	1.2	2.9
3.....	5.2	(*)	8.1	10.3	11.3	3.3	5.4	6.9	2.5	4.1	1.5	2.6
4.....	5.2	.....	7.8	10.5	10.1	3.1	5.1	9.0	2.4	3.7	1.6	2.3
5.....	5.3	.....	7.6	10.1	8.8	3.0	4.9	8.9	2.3	3.1	1.5	1.8
6.....	5.3	.....	7.5	9.7	7.8	2.9	4.5	8.6	2.4	2.8	1.3	2.0
7.....	5.3	.....	7.5	9.4	7.2	2.9	4.1	8.0	2.4	2.6	1.3	2.0
8.....	5.1	4.3	7.4	8.8	6.8	3.0	3.9	8.5	2.5	2.4	1.2	1.9
9.....	(*)	4.4	7.4	8.4	6.5	2.9	3.7	10.0	2.9	2.3	1.5	1.9
10.....	.....	6.1	7.4	7.9	6.1	2.8	3.5	10.7	3.0	2.2	1.6	1.8
11.....	.....	8.7	7.3	7.7	5.7	2.8	3.8	12.7	3.6	2.0	1.3	1.6
12.....	.....	10.2	8.1	8.5	5.6	3.0	3.5	12.9	5.5	2.0	1.3	1.5
13.....	.....	11.4	9.6	10.5	5.4	3.3	3.0	12.0	6.0	2.0	1.3	1.5
14.....	.....	14.5	10.1	10.2	6.0	4.8	3.0	11.0	6.0	2.0	1.3	1.5
15.....	.....	15.8	10.1	9.8	7.8	6.9	3.0	9.7	4.3	1.9	1.3	1.5
16.....	.....	15.6	9.9	9.5	8.1	8.9	3.0	8.4	4.4	1.8	1.5	1.4
17.....	.....	14.3	9.6	11.7	7.4	8.3	2.9	7.4	3.9	1.8	1.7	1.4
18.....	.....	13.1	9.1	14.0	6.4	7.9	2.9	6.6	6.0	1.7	2.3	1.4
19.....	.....	12.7	8.7	13.8	5.9	7.2	2.8	6.0	6.5	1.7	2.6	1.4
20.....	.....	11.5	8.1	13.0	5.5	6.8	2.6	5.5	5.2	1.6	2.3	1.4
21.....	.....	10.7	7.8	14.1	5.2	6.8	2.5	5.0	5.3	1.5	2.7	1.3
22.....	.....	10.0	7.7	13.6	4.8	6.5	2.5	4.7	5.1	1.5	3.8	1.3
23.....	.....	9.5	7.3	12.3	4.8	6.0	2.4	4.2	4.8	1.4	6.2	1.3
24.....	.....	9.1	6.9	11.0	5.1	6.0	2.3	3.9	4.4	1.4	8.0	1.4
25.....	.....	9.0	6.6	9.8	5.2	5.9	2.3	3.7	3.9	1.4	7.0	1.8
26.....	.....	9.4	6.4	8.8	4.7	5.7	3.9	3.5	3.5	1.3	5.8	1.9
27.....	4.5	9.7	6.2	8.0	4.4	5.5	7.2	3.3	3.8	1.3	5.0	2.4
28.....	4.5	9.3	6.1	8.5	4.1	6.2	7.9	3.1	4.1	1.3	4.6	2.4
29.....	4.4	.....	6.1	8.5	3.9	6.6	7.0	3.0	3.8	1.5	4.0	2.2
30.....	4.4	.....	6.8	8.9	3.6	6.5	6.0	2.8	5.0	1.5	.....	2.2
31.....	4.4	.....	6.9	.....	3.6	.....	5.0	2.7	.....	1.5	.....	2.1

*Frozen.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	2.0	2.5	4.9	2.7	4.6	6.3	4.0	2.6	1.9	2.1	2.0	.....
2.....	1.8	2.6	4.6	2.5	4.5	5.6	4.0	2.6	1.8	2.2	2.0	.....
3.....	(*)	2.8	4.4	2.4	4.3	5.5	4.7	2.4	1.9	2.1	2.0	.....
4.....	.....	2.7	4.2	2.3	5.5	5.5	5.9	2.2	1.9	1.9	1.9	.....
5.....	.....	2.7	3.9	2.2	13.6	5.6	5.3	2.0	1.9	1.9	1.8	.....
6.....	.....	2.9	4.5	2.1	16.3	5.6	5.0	1.9	2.1	1.9	1.7	.....
7.....	.....	3.2	6.1	2.0	16.6	6.0	4.8	1.9	2.5	1.8	1.6	.....
8.....	.....	4.2	10.0	1.9	14.9	6.1	4.7	1.9	2.4	1.8	1.5	.....
9.....	.....	6.0	10.4	1.8	14.1	6.1	4.9	2.1	2.3	1.7	1.5	.....
10.....	.....	5.7	9.4	2.5	12.9	5.6	5.4	2.0	2.2	1.7	1.5	.....
11.....	.....	5.6	8.6	2.4	11.5	5.2	5.3	1.9	3.0	1.7	1.4	.....
12.....	.....	6.3	8.0	2.3	10.1	5.3	5.3	1.8	3.6	1.9	1.4	.....
13.....	.....	6.0	7.5	2.2	8.8	5.7	5.8	1.7	3.6	3.1	1.3	.....
14.....	2.2	6.2	7.4	2.2	7.5	6.8	6.2	1.5	3.5	5.4	1.3	.....
15.....	1.2	9.5	6.9	2.1	6.5	7.5	5.9	1.5	3.7	8.1	1.3	.....
16.....	1.2	13.1	6.4	2.0	6.5	7.9	5.3	1.5	3.5	8.6	1.3	.....
17.....	1.3	12.7	5.8	2.0	5.3	7.7	4.6	1.5	3.1	8.1	1.2	.....
18.....	1.3	11.7	5.4	1.9	5.1	7.4	4.3	1.8	2.9	7.3	1.1	.....
19.....	1.1	11.1	4.9	1.9	5.1	7.5	4.1	1.9	2.8	6.4	1.1	.....
20.....	1.1	10.4	4.6	1.9	5.4	8.2	3.8	1.7	2.5	5.4	.....	.....
21.....	1.1	9.5	4.3	2.0	5.4	8.8	3.7	1.8	2.5	4.8	.....	.....
22.....	1.2	8.8	4.1	2.0	5.4	8.0	3.5	1.8	2.5	4.3	.....	.....
23.....	1.6	8.0	3.1	2.0	5.5	7.6	3.3	1.8	2.4	3.9	.....	.....
24.....	2.0	7.5	3.6	2.3	5.4	7.0	3.3	1.7	2.4	3.7	.....	.....
25.....	3.9	6.9	3.4	2.9	5.3	6.3	3.0	1.7	2.4	3.4	.....	.....
26.....	3.8	6.1	3.0	2.9	5.4	5.6	3.0	1.9	2.5	3.2	.....	.....
27.....	3.3	5.5	3.2	2.9	5.6	5.2	2.8	1.9	2.8	3.0	.....	.....
28.....	3.0	5.1	3.3	3.5	5.9	4.8	2.7	2.0	2.8	2.8	.....	.....
29.....	2.8	.....	3.2	3.5	6.2	4.0	2.6	1.8	2.5	2.6	.....	.....
30.....	2.6	.....	3.1	3.6	7.1	4.0	2.6	1.7	2.4	2.5	.....	.....
31.....	2.5	.....	2.9	.....	7.1	.....	2.6	1.8	.....	2.2	.....	.....

*Frozen.

H. Ex. 28-11

353 Government offered in evidence as Exhibit 40 pages 9 and 1391 or report of chief of engineers for 1886, relating to Arkansas River, reading:

"10. Continuation of survey of Arkansas River from Wichita, Kansas, to Fort Gibson, Indian Territory (provided for in the river and harbor act of August 2, 1882.) There was expended to June 30, 1885, upon this, \$9,120.87, which completed the field work in an indifferent way, and plotted the notes after a very rough fashion.

During the fiscal year ending June 30, 1886, the balance of the allotment, \$179.13, was expended in putting the maps in a little better shape, and in preparing a rough tracing to forward with the plans and estimates for this reach of river. This still leaves the maps in a very unsatisfactory condition.

A report was prepared and submitted January 23, 1886, which was printed as House Ex. Doc. No. 90, Forty ninth Congress, first session, with full plans and estimates for the improvement of the river from Arkansas City, Kans., to Fort Gibson, Indian Territory."

"Continuation of the survey of Arkansas River from Wichita, Kansas, to Fort Gibson, Indian Territory.

Provided for in the river and harbor Act of August 2, 1882. There was expended to June 30, 1885, upon this \$9120.87, which completed the field work in an indifferent way, and plotted the notes after a very rough fashion.

During the fiscal year ending June 30, 1886, the balance of the allotment, \$179.13, was expended in putting the maps in a little better shape, and in preparing a rough tracing to forward with the plans and estimates for this reach of river. This still leaves the maps in a very unsatisfactory condition.

A report was prepared and submitted January 23, 1886, which was printed as House Ex. Doc. 90, Forty ninth Congress, first session, with full plans and estimates for the improvement of the river from Arkansas City, Kans., to Fort Gibson, Ind. T."

354 The Government here offered in evidence Exhibit 41 being a report of Chief of Engineers on removing of constructions in Arkansas River, which reads as follows, to-wit:

355 Office of the Chief of Engineers,
United States Army,

Exhibit 41.

Washington, D. C., October 4, 1890.

3. Removing obstructions in Arkansas River, Arkansas, and Kansas.—Prior to the first improvements in 1833, shifting sand-bars, numerous drift-piles, and dangerous snags constituted the obstacles to navigation in the lower reaches, and

gravel and rock-shoals, with a few snags and many overhanging trees, constituted those of the upper. Except for a few special reaches, like the Fort Smith and Pine Bluff, the general plan of improvement has consisted in snagging operations, including the cutting of overhanging trees, in building to improve the shoals, and in surveys, looking toward plans for its permanent improvement.

The appropriations to June 30, 1890, amount to \$465,251.37. Of this sum there had been expended to June 30, 1889, \$380,568.68.

During the fiscal year ending June 30, 1890, \$10,719.99 were expended in snagging operations at low water, and in completing the maps of the river.

July 1, 1889, amount available	\$12,157.88
July 1, 1890, amount expended during fiscal year, exclusive of liabilities outstanding July 1, 1889	\$10,801.56

July 1, 1890, outstanding liabilities.....	81.67
	<hr/>
	10,801.66

July 1, 1890, balance available	1,356.22
Amount appropriated by act of September 19, 1890	20,000.00

Amount available for fiscal year ending June 30, 1891	<u>21,356.22</u>
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Amount (estimated) required for completion of existing project annually	35,000.00
Submitted in compliance with requirements of sections 2 of river and harbor acts of 1866 and 1867.	

(See Appendix X 3.)

356 4. Arkansas River, Arkansas.—By act of August 5, 1886, \$75,000 was appropriated for continuing the improvement of Arkansas River, in accordance with the plan and recommendations contained in Appendix V.13, House Ex. Doc. No. 1, Forty-ninth Congress, first session, which provided that \$8,000 be expended at Pine Bluff; \$13,000 at Fort Smith, and \$10,000 at Dardanelle, or so much thereof as may be necessary. The approved project for the expenditure of this sum is as follows: At Pine Bluff, the \$8,000 to be used in extending and repairing the dikes, and for protecting the town front. At Fort Smith the \$13,000 to be expended in

erecting a permeable dike a little above the town to retain the channel along the city wharves. At Dardanella the \$10,000 to be expended in erecting a permeable dike above the town to remove sand-bar now in front of the wharves.

From Little Rock to the mouth the balance and so much as may not be required at the three places above specified, to be expended in the erection of permeable dikes at the worst places, looking towards the permanent improvement of the river to give at least a depth of 5 feet at extreme low water. By act of August 11, 1888, \$150,000 was appropriated under this head as follows:

Improving Arkansas River Ark.: Continuing improvement: \$150,000. Provided That nothing herein contained shall authorize the Secretary of War to enter upon the project if improvement of said river as set forth in the report of the Board of Engineers on improvement of the Arkansas River from Wichita, Kans., to its mouth, dated New York City, March 16, 1888, and contained in House Executive Document No. 234, first session, Fiftieth Congress: Provided, That the Secretary of War shall expend the appropriation under this head with reference to the final improvement of this river as contemplated in the Report of the Chief of Engineers, for the year ending July 1, 1885, and as authorized in the act for the improvement of rivers and harbors, approved August 5, 1886, and
357 in House Executive Document No. 90, Forty-ninth Congress, first session, said methods to be applied, as the Secretary of War may direct, at such points between Wichita, Kansas, and the navigable mouth of the Arkansas River, at its junction with the Mississippi River, as he may deem for the best interests of commerce. And all moneys now to the credit of different sections of the Arkansas River, other than the appropriations for the operating of snag boats, shall be available for use under this head; and in future the engineer in charge of this work and the Secretary of War shall make report upon disconnected projects, as heretofore. Nothing herein contained shall be understood to prevent the Secretary of War from applying any part or all of the funds previously appropriated for use at Fort Smith, Dardanella, in Pine Bluff reach, or from expending not exceeding \$4,000 to remove the bar in front of Van Buren, or from allotting not exceeding \$8,000 as a contingent fund for the expenditure in Pine Bluff Reach.

The approved project for the expenditure of this sum may likewise be summarized as follows:

At Pine Bluff the same as above. At Van Buren the \$4,000 to be expended in erecting a permeable dike at a suitable point a little above the town, and upon the opposite side of the river, to contract the channel and prevent it from leaving the city wharves. From Fort Gibson, Indian Territory, to the mouth of the river, the balance to be expended in the erection of permeable dikes, and in one instance, by rock excavation, at the worst places or the places at which serious interference with the largest amount of commerce occurs, so far as the amount of the appropriation will permit, looking toward the permanent improvement of the river to give the channel as provided under the act of August 5, 1886, from Little Rock to the mouth; and an all year round depth of water of at least 2 feet from Little Rock, Ark., to Fort Gibson, Indian Territory.

358 Before operations were begun at Fort Smith the old jetty at that place, built in 1877 and 1878, had so far disappeared as to render no service, and the river was about to throw a bar along the wharves of the town, cutting off all approach to the wharf at low water or at medium stage. From Fort Gibson to the mouth of the river the river consists of alternating bars and caving banks, with crossings more or less troublesome at low water, a few of the latter operating to effectually close the river to navigation at extreme low water for even boats drawing but 2 feet of water.

During fiscal year ending June 30, 1890, \$4,684.56 have been expended at Pine Bluff in the erection of a new dike and in repairing and extending two old ones.

From Fort Gibson, Indian Territory, to the mouth of the river, \$52,786.19 have been expended according to projects.

Numerous rises and limited amount of plant have rendered is impossible to give that relief to navigation which an ordinary season would have permitted. There were erected three dikes just above Fort Smith, aggregating 1,200 in length, and one dike 300 feet long near Wilson's Rocks.

Two quarter boats and ten barges were built, and material accumulated for three dikes 3 miles below Pine Bluff. One of these dikes was partly completed, a new hull for the quarter

boat Lizette was begun, and some material accumulated for the work at Moore's Rocks.

July 1, 1889, amount available\$122,295.82

July 1, 1890, amount expended during fiscal year,
exclusive of liabilities outstanding

July 1, 1889\$51,007.60

July 1, 1890, outstanding liabilities ... 2,384.34 53,391.94

July 1, 1890, balance available 68,903.88

Amount appropriated by act of September 19, 1890 180,000.00

Amount available for fiscal years ending June 30,
1891 248,903.88

Amount (Estimated) required for completion of
existing project3,472,479.00

Submitted in compliance with requirements of sections 2 of
river and harbor acts of 1866 and 1867.

(See Appendix X 4.)

359 Removing Obstructions in Arkansas River, Arkansas and Kansas.

As the first expenditure on this river was made as early as 1833, it is not an easy matter to determine what was the original condition of the navigable portion of this stream, but from the delta-like character of its lower portion, and the tendencies now manifest in its upper reaches, it may be inferred, upon very substantial grounds, that shifting sand-bars, numerous drift-piles, and dangerous snags characterized the obstacles to navigation in the lower reaches; and gravel and rock shoals, with a few snags and many overhanging trees, constituted those of the upper reaches. The records of this office indicate that except at a few places, such as Pine Bluff, Ark., and Fort Smith, Ark., the general plan of improvement has consisted of snagging operations, which includes cutting overhanging trees and in building wing-dams to improve the shoals, the idea being to afford temporary relief to navigation until complete surveys should render it possible to project a plan for the radical permanent improvement of the navigable portion of the entire river. For the exceptions noted, attention is respectfully invited to reports upon those special cases.

The appropriations have been made sometimes for the entire navigable reach and sometimes for certain sections. The grand total of all these appropriations up to June 30, 1890,

amounted to \$465,251.37. Of this there had been expended up to June 30, 1899, \$380,568.68, exclusive of certain sums, aggregating over \$100,000, that were appropriated with the Mississippi and Missouri rivers, so as not readily to be determined. The most permanent result of all this expenditure consists in a series of maps made by S. T. Abert from a survey of the river from Fort Gibson, Ind. T., to Big Rock, Ark., 3 miles above Little Rock, Ark., in the year 1870. From the nature of the case, the balance of the work has been each year a repetition of that of preceding years. One iron-hulled snag-boat and one light draught wooden snagboat, with all
 360 the appliances necessary for snagging operations, were the visible signs of the balance, while the gratitude of those interested in the navigation of the river, for a navigation rendered yearly less and less dangerous by the operations of these two boats, is the only evidence existing and the only evidence to be expected of work that must be done in a stream like this; until by some system of permanent improvement, caving banks no longer exist and the annual quota of snags is no longer furnished. The most economical management of snag-boats requires not less than \$35,000 annually to give absolutely indispensable aid to navigation, a navigation in which a vast amount of commerce is vitally interested.

Under the act approved August 11, 1888, \$5,000 were appropriated for the work. This sum of course is included in the above total. This act provides that an outlay of \$10,000 be applied to the construction of a new hull for the snag-boat Wichita, and \$375 be used for completing the survey and maps, i. e., so much of these sums respectively as may be necessary. The reconstructed Wichita, built in the fiscal year ending June 30, 1889, as may be seen in the Annual Report for that year, is a powerful, well-adapted, light-draught snag-boat, and her services during the fiscal year ending June 30, 1890, bear out the expectation in regard to her efficiency. During the said fiscal year \$10,719.99 were expended in the care and running expenses of this boat and in the completion of the survey and maps. This provides the Engineer Department with convenient lithograph maps of the entire reach of the river from Wichita to its mouth.

Early in the year and as soon as low-water season arrived, the snag-boat was put in commission and operated at or near low water only, over the entire reach from Webber's Falls, Indian Territory, to Little Rock, Arkansas, before the season of fall trade set in. During this time she removed 552

dangerous low-water snags, cut 231 overhanging trees, and removed accumulations of drift.

361 The Government here offers in evidence Exhibit 42
being report of Chief of Engineers on Improvement of
the Arkansas River in Arkansas, Indian Territory and Kan-
sas, which reads as follows, to-wit:

362 Office of the Chief of engineers,
United States Army,
Washington, D. C., September 23, 1891.
Exhibit 42.

Improvement of Arkansas River, Arkansas, Indian Terri-
tory, and Kansas, and of Certain Rivers in Arkansas
and Missouri.

Officers in charge, Capt. H. S. Taber, Corps of Engineers;
Division Engineer, Col. C. B. Comstock, Corps of Engineers.

1. Removing obstructions in Arkansas River, Arkansas, Indian Territory, and Kansas. Prior to the first improvements in 1833 shifting sand bars, numerous drift piles, and dangerous snags constituted the obstacles to navigation in the lower reaches, and gravel and rock shoals, with a few snags and many overhanging trees, constituted those of the upper. Except for a few special reaches, like the Fort Smith and Pine Bluff, the general plan of improvement has consisted in snagging operations, including the cutting of overhanging trees, in building wing dams to improve the shoals, and in surveys looking towards plans for its permanent improvement.

The appropriations to June 30, 1891, amount to \$485,251.37. Of this sum there has been expended to June 30, 1890, \$391,288.67.

During the fiscal year ending June 30, 1891, \$9,330.43 were expended in snagging operations at or near low water. The unusually well maintained high water of this year has prevented very extensive operations. Two light-draft snag boats are required similar to the one now in use to take advantage of the low-water season. With \$70,000 in hand July 1, 1892, an effective clearance of the Arkansas River could be secured. After that the two snag boats could be utilized as towboats upon the work of "Improving Arkansas River, Arkansas, Indian Territory, and Kansas," being used for snagging purposes whenever necessary. It would be ad-

vantageous and economical if in future the appropriations for snagging and for the permanent improvement of the river could be made under one head, and a specific sum set apart for snagging, if deemed best.

Amount appropriated by act approved Sept. 19, 1890	20,000.00
	<hr/>
	21,674.89
June 30, 1891, amount expended during fiscal year. .	9,330.43
	<hr/>
July 1, 1891, balance unexpended	12,344.46
July 1, 1891, outstanding liabilities	1,227.55
	<hr/>
July 1, 1891, balance available	11,116.91
	<hr/>
Amount that can be profitably expended in fiscal year ending June 30, 1893:	70,000.00

Submitted in compliance with requirements of sections 2 of river and harbor acts of 1866 and 1867.

(See Appendix W 1.)

2. Arkansas River, Arkansas, Indian Territory, and Kansas. Work during the past season has been carried on under three different acts of Congress. By the act approved August 5, 1886, \$75,000.00 was appropriated, its distribution being indicated in the following words: Improving Arkansas River, Arkansas: Continuing improvement, \$75,000, according to the plan and recommendations in Appendix V 13, Report of Chief of Engineers, 1885, pages 1601 to 1611, of which there are to be expended \$8,000 at Pine Bluff, \$13,000 at Fort Smith, and \$10,000 at Dardanelle or so much thereof under those sums, respectively, as may be necessary at those points.

363 This appropriation, except a small sum out of the \$10,000.00 for Dardanelle, was expended prior to June 30, 1890; at Dardanelle the \$10,000 was to be expended in erecting a permeable dike above and opposite the town, in such a position as to remove the said bar in front of the wharves. By act of August 11, 1888, the sum of \$150,000 was appropriated for improvement of this river, under plan providing for the formation of a channel at least 200 feet wide and 6 feet deep at low water, from Little Rock to the Mississippi River; and the formation of a channel 2 feet deep at low water and from 200 to 800 feet wide from Fort Gibson to Arkansas

City, as contemplated in the report of the Chief of Engineers for the year ending June 30, 1885, and in House Ex. Doc. No. 90, Forty-ninth Congress, first session, and authorized in the act approved August 5, 1886.

By act approved September 19, 1890, the sum of \$180,000 was appropriated, its distribution being indicated as follows:

Improving Arkansas River, Arkansas, Indian Territory, and Kansas; Continuing improvement from Wichita, Kansas, to its mouth, one hundred and eighty thousand dollars.

The approved projects for the expenditure of this sum may be summarized as follows: At Pine Bluff \$8,000 is to be used in extending and repairing the dikes, for protection of the town front. At Van Buren \$4,000, to be expended in erecting a permeable dike at a suitable point a little above the town and upon the opposite side of the river, to contract the channel and prevent it from leaving the city wharves. From Fort Gibson, Ind. T., to the mouth of the river, the balance to be expended in the erection of permeable dikes and in rock excavation at worst places, so far as the amount of the appropriation will permit, looking towards the permanent improvement of the river, to give a channel at least 6 feet deep and 200 feet wide from Little Rock to the mouth of the river, via White River Cut off, as provided under the act of August 5, 1886, and an all year-round depth of water of at least 3 feet from Little Rock, Ark., to Fort Gibson, Ind. T.

Before operations were begun at Dardanelle a bad bar had formed along the town front, cutting off all approach to either wharf at low water or at medium stage. At Pine Bluff, before improvement, a cut-off was threatened at one point, which would change the slope of the river from three-fourths of a foot to 4 feet per mile; at another point a bad bar interfered with navigation at low water; and in the sharp bend in front of the town the river was eroding the banks with a rapidity that threatened the town. (See Annual Report, Chief of Engineers, 1887, page 1515.)

From Fort Gibson to the mouth of the river the river consists of altering bars and caving banks, with crossings more or less troublesome at low water, a few of the latter operating to effectually close the river to navigation at extreme low water for even boats drawing but 2 feet of water.

During the fiscal year ending June 30, 1891, \$2,116.60 was expended at Pine Bluff out of the 1888 appropriation, in con-

junction with the 1890 appropriation, in extending Dike No. 2 and repairing Dikes 3 and 4.

From Fort Gibson, Ind. T., to the mouth of the river, \$94,201.01 has been expended.

There were erected two dikes just above Fort Smith, each 400 feet long, and two dikes, 30 miles above Fort Smith, were well advanced towards completion. Five dikes, aggregating 3,057 feet in length, were erected below Pine Bluff. Ten new barges were built, and additions made to the machinery, and some work done at excavation at Moore's rocks.

July 1, 1890, balance unexpended	\$71,295.42
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Amount appropriated by act approved Sept. 19, 1890 180,000.00

251,295.42

June 30, 1891, amount expended during the fiscal

year	94,194.61
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364	July 1, 1891, balance unexpended	157,100.81
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July 1, 1891, outstanding liabilities	3,774.80
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July 1, 1891, balance available	153,326.01
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(Amount (estimated) required for completion of existing project	3,472,479.00
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(Amount that can be profitably expended in fiscal year ending June 30, 1893	1,000,000.00
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(Submitted in compliance with requirements of sections 2 of
river and harbor acts of 1866 and 1867.

365 Chamber of Commerce.

Fort Smith, Ark., June 27, 1891.

Dear Sir: I herewith inclose your questions in regard to river business, and answers thereto. Capt. John Matthews, a good authority on such matters, suggested the answers. I am afraid the answers are not satisfactory enough because we can not back them up with figures. This is impossible, as no record of the amount of business and increase of the same has been kept. If we can render you further assistance in this important matter, command us. The chamber of commerce, and the people of Fort Smith generally appreciate the good work you are doing, and the kindly interest you have always taken in western Arkansas and Fort Smith.

I have talked with river men, lumbermen, and prominent shippers, and they all agree that the river has been greatly benefited by your work and the river business wonderfully increased thereby. The Fort Smith Merchant's Transportation Company now own two good boats, the John Matthews, which cost \$10,000, and the William Druhe No. 2, which recently cost \$6,600. They ply between Webber Falls and Dardanelle. This shows that our business men have faith in the increasing river business which affords them such cheap transportation.

Yours very truly,

R. H. ADAIR,

Secretary.

Capt. H. S. Taber.

United States Engineer Office,

Little Rock, Ark., May 29, 1891.

Dear Sir:

Questions and answers.

1. How much freight was carried yearly before the river was worked by the Government?

Answer. Fifteen years ago comparatively no business was transacted on the river on account of insufficient water and steamboat facilities. Within the last 10 years, by reason of the improvement in the channel, our steamboat facilities have increased, and the business now requires two steamboats between Webber Falls and Dardanelle.

2. If the river was so improved as to be navigable at high, medium, and low water, how much, if any, would be the cost of shipping freight be reduced?

Answer. Freight would be reduced at least 100 per cent. The principal towns between Fort Gibson and Dardanelle are on the river and they would be supplied with merchandise by Fort Smith merchants and this would afford the best market that tributary country could get for its products. This would encourage competition in the steamboat business and still reduce the cost of freight.

3. If the river was so improved as stated in the recent question would it bring the freight down any, and if so, how much?

Answer. Yes, it would greatly reduce freight. The reduction would be from 50 to 100 per cent.

4. How much more freight of different kinds would be shipped every year if the river was improved as suggested in the second question?

Answer. The business would increase rapidly and to such an extent that it would be hard to even estimate it. The thousands of acres of rich valley lands that are now unimproved on account of the cost of getting its produce to market would be brought under a high state of cultivation at once. New towns would spring up along the river, and our present line of steamers would soon be inadequate to do the work.

5. Are there any other ways in which the people of your town, county, or section would be benefited? If so, please name them.

366 Answer. It would aid materially in opening up a tributary country to Fort Smith that is rich in minerals, coal, and timber, as well as in agriculture, and whose business would be of incalculable value. This country is now practically cut off by reason of the great expense of getting to market. There is no richer country than the Arkansas Valley, and the question of transportation is what interests the people more than anything else.

MR. R. H. ADAIR,
Secretary Chamber of Commerce,
Fort Smith, Ark.

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United States Engineer Office,
Little Rock, Ark., July 9, 1895.

General: I have the honor to forward herewith annual reports for the fiscal year 1895 of the following works of river and harbor improvement under my charge.

Very respectfully, your obedient servant,

WM. L. SIBERT,
First Lieutenant of Engineers.

Brig. Gen. Wm. P. Craighill,
Chief of Engineers, U. S. A.

VI.

Removing Obstructions in Arkansas River, Arkansas and Kansas.

This work was under the charge of Capt. Carl F. Palfrey, Corps of Engineers, until August 15, 1894, when I relieved him under Special Orders, No. 179, paragraph 17, Adjutant-General's Office, series of 1894.

Object.—To remove (otherwise than by permanent works) obstructions to navigation.

Project.—Originally to raise and destroy snags, cut overhanging timber, remove bowlders and reefs by blasting and dredging, and to cut out sand bars by temporary wing dams. The survey of the river with a view to project for permanent improvement was included under this head.

Since appropriations for permanent improvement were made, blasting, dredging, and dams have been omitted from the project under this head, leaving the customary snagging operations only.

Operations of Previous Years.

The first snagging operations were under the act of July 3, 1832. The work began about August, 1833, and February 18, 1834, is said to be the date of arrival of the first snag boat, Archimedes, at Little Rock. Of the work done prior to 1868 I am unable to give any information.

368 Abstract of work done, 1868 to 1894, inclusive.

Fiscal year	Snags removed	Trees cut	Trees deadened	Drift Piles removed	Between
1868	134				Mouth and Douglass landing.
1869	50	1			(?)
1870	805	114			(?)
1871	1169	5925			Mouth and Illinois Bayou.
1872	542	257		2	Mouth and Pine Bluff
1873	110	44			Little Rock and Bentleys Bar
1875	663	1570		23	Mouth and Fairdale
1876	545	1274		5	Mouth and (?)
1877	193	234		3	Mouth and Silver Lake
1878	430	1177		11	Mouth and Little Rock
1880	750	488		19	Mouth and Trustee Bend.
1881	391	346		23	Little Rock and Webbers Falls
1882	976	3460		18	Mouth and Fort Smith
1883	1287	786		8	Do.

1884	1118	1135		8	Mouth and Fort Gibson
1885	2244	14325	17	20	Mouth and near Pawnee Agency
1886	109	14		2	Mouth and Little Rock.
1887	1385	143			Mouth and Fort Smith
1890	552	231			Little Rock and Webers Falls
1891	300	2000	13000		Little Rock and Mouth
1892	787	544		4	Mouth and Webbers Falls
1893	862	670		17	Pine Bluff and Dardanelle
1894	387	1346		1	Little Rock and Hog Thief Bend

During the time covered by the above abstract three snag boats have sunk while in service, the Northwest at Stanleys in fiscal year 1868, the Thayer at Bentleys Bar in fiscal year 1873, and the Pioneer at Hughes Bend in fiscal year 1893.

The records of the Northwest were lost when the boat sunk, hence her work is not included in that of 1868.

369

Channel.

The Arkansas River is a stream whose bed and banks are to a great extent composed of a sandy loam. This material is eroded very easily, and as a result the channel of the stream is continually changing, the concave banks wearing away, and the opposite point bars building out.

From Little Rock to the mouth (173 miles) the river valley is entirely alluvial, and the entire bank is liable to cave if attacked by the water. Above Little Rock the conditions are the same, except at those places where the stream runs next to the hills that jut out into the valley. Even though the valley be very narrow, the character of the bottom land is the same.

From the data in the possession of this office, which is not very complete, the average amount of bank caved in per mile per year from Little Rock to the mouth is about 7.64 acres; from Little Rock above, about 1.99 acres.

Ordinarily in low water there is approximately 3 feet of water on the shallowest crossings from the mouth to Silver Lake, a distance of about 40 miles; from there up to Webers Falls, in Indian Territory, there is no great difference in depth, being about 16 inches on the shallowest crossings to 20 miles above Little Rock, and 12 to 14 inches from there on up. The increased depth in the lower 40 miles of the river is evidently due to the effect the backwater from the Mississippi has on this portion of the stream.

The checking of the current by this backwater causes immense deposits of material in that portion. When a concave

bank wears away, the opposite point bar builds up in two or three years to near the height of the original bank, thus keeping the river bed narrow; while above where this condition exists the high concave banks wear away and the bars opposite build up very slowly, and, as a consequence, when the river rises 2 or 3 feet it spreads out until it is wider than in the lower part of the stream.

This condition of course requires more rainfall to produce a navigation depth and causes in a great many cases a
370 different channel in high and low water, leveling the bars and filling up the low-water channel to such an extent as to make it a difficult task for the low-water current to cut out its original channel.

The low-water channel as a consequence wanders between these high banks after different rises.

While engaged in snagging operations between Little Rock and Pine Bluff the snag boat Sheldon reported 19 inches over Fourche Bar October 12; 18 inches over Wild Cat October 27; 16 inches over Wrights Crossing November 1; 18 inches on Kings Bar and Wrights November 12. The Signal Service gauge at Little Rock was 3.6 feet on the first-mentioned date and 2.6 feet on the last mentioned. In May the tow-boat Cleveland (draft forward 18 inches and aft 20 inches) returned from St. Francis River and encountered considerable difficulty in reaching Little Rock? Extracts from the log are: "May 21, lost two hours on Victoria Bar; worked rest of day on Rob Roy Bar. May 23, pulled over Rob Roy Bar at 10:30 a. m.; lost two hours on Furgus Bar. May 24, all day on Kings Bar. May 25, lost four hours on Cates Bar. May 26, can't get over Fourche Bar."

The Signal Service gauge at Little Rock read from 2.8 feet to 3 feet during the time, and all commercial navigation was suspended.

371 The Government here offered in evidence as Exhibit 43 the following from page 1542 of report of Chief of Engineers for 1894: which reads as follows, to-wit:

"No navigation above Webber Falls was reported. The river was navigable to this place all of June, part of July, part of August, part of October, November and December, 1893; part of January and all of February, March, April, and May, 1894. Bruce's Island was the head of low water navigation."

372 (Plaintiff's Exhibit 44.)

(Report of the Chief of Engineers, 1895.)

373 Office of the Chief of Engineers,

United States Army,

Washington, D. C., September 28, 1895.

Improvement of Arkansas River and of Certain Rivers in
Arkansas and Missouri.

This district was in the charge of Capt. Carl F. Palfrey, Corps of Engineers, to August 16, 1894, and of Lieut. W. L. Sibert, Corps of Engineers, since that date; Division Engineers, Col. C. B. Comstock, Corps of Engineers, to February 3, 1895, and Col. H. M. Robert, Corps of Engineers, since February 5, 1895.

1. Removing obstructions in Arkansas River, Arkansas and Kansas.—This river was, previous to improvement, seriously obstructed by snags, overhanging timber, reefs, and bars.

The original project under this head was to raise and destroy snags, cut overhanging timber, remove bowlders and reefs by blasting and dredging, and cut out sand bars by temporary wing dams. To this was later added the survey of the river, with the view to permanent improvement.

Since appropriations for permanent improvement were made, blasting, dredging, and dams have been omitted from the project, leaving customary snagging operations only.

On this work had been expended from the first appropriations in 1832 up to June 30, 1894, \$851,210.62.

The evidence of pilots and masters is that in the permanent reaches of the river the condition has been materially improved; in the shifting channels the relief is only temporary and the obstructions to navigation are still numerous and dangerous. The best illustration of the condition is the fact that steamboats have to pay 18 per cent per annum for insurance.

The operations of the fiscal year have been confined to the reaches of river between foot of Cut-off and Homestead and

between Mud Lake and Little Rock. They have made navigation easier.

374

United States Engineer Office,
Little Rock, Ark., July 9, 1895.

General: I have the honor to forward herewith annual reports for the fiscal year 1895 of the following works of river and harbor improvement under my charge.

Very respectfully, your obedient servant,

WM. L. SIBERT,
First Lieutenant of Engineer.

Brig. Gen. Wm. P. Craighill,
Chief of Engineers, U. S. A.

VI.

Removing Obstructions in Arkansas, River, Arkansas and Kansas.

This work was under the charge of Capt. Carl F. Palfrey, Corps of Engineers, until August 15, 1894, when I relieved him under Special Orders, No. 179, paragraph 17, Adjutant-General's Office, series of 1894.

Object.—To remove (otherwise than by permanent works) obstructions to navigation.

Project.—Originally to raise and destroy snags, cut overhanging timber, remove bowlders and reefs by blasting and dredging, and to cut out sand bars by temporary wing dams. The survey of the river with a view to project for permanent improvement was included under this head.

Since appropriations for permanent improvement were made blasting, dredging, and dams have been omitted from the project under this head, leaving the customary snagging operations only.

Operations of Previous Years.

The first snagging operations were under the act of July 3, 1832. The work began about August, 1833, and February 18, 1834, is said to be the date of arrival of the first snag boat, Archimedes, at Little Rock. Of the work done prior to 1868 I am unable to give any information.

375 Abstract of work done, 1868 to 1894, inclusive.

Fiscal year	Snags removed	Trees cut	Trees deadened	Drift piles removed	Between
1868	134				Mouth and Douglass landing.
1869	50	1			(?)
1870	805	114			(?)
1871	1169	5925			Mouth and Illinois Bayou.
1872	542	257		2	Mouth and Pine Bluff
1873	110	44			Little Rock and Bentleys Bar
1875	663	1570		23	Mouth and Fairdale
1876	545	1274		5	Mouth and (?)
1877	193	234		3	Mouth and Silver Lake
1878	430	1177		11	Mouth and Little Rock
1880	750	488		19	Mouth and Trustee Bend.
1881	391	346		23	Little Rock and Webbers Falls
1882	976	3460		18	Mouth and Fort Smith
1883	1287	786		8	Do.
1884	1118	1135		8	Mouth and Fort Gibson
1885	2244	14325	17	20	Mouth and near Pawnee Agency
1886	109	14		2	Mouth and Little Rock.
1887	1385	143			Mouth and Fort Smith
1890	552	231			Little Rock and Webbers Falls
1891	300	2000	13000		Little Rock and Mouth
1892	787	544		4	Mouth and Webbers Falls
1893	862	670		17	Pine Bluff and Dardanelle
1894	387	1346		1	Little Rock and Hog Thief Bend

During the time covered by the above abstract three snag boats have sunk while in service, the Northwest at Stanlays in fiscal year 1868, the Thayer at Bentleys Bar in fiscal year 1873, and the Pioneer at Hughes Bend in fiscal year 1893.

The records of the Northwest were lost when the boat sunk, hence her work is not included in that of 1868.

376

Channel.

The Arkansas River is a stream whose bed and bank are to a great extent composed of a sandy loam. This material is eroded very easily, and as a result the channel of the stream is continually changing, the concave banks wearing away, and the opposite point bars building out.

From Little Rock to the mouth (173 miles) the river valley is entirely alluvial, and the entire bank is liable to cave if attacked by the water. Above Little Rock the conditions are the same, except at those places where the stream runs next to the hills that jut out into the valley. Even though the valley be very narrow, the character of the bottom land is the same.

From the data in the possession of this office, which is not very complete, the average amount of bank caved in per mile per year from Little Rock to the mouth is about 7.64 acres; from Little Rock above, about 1.99 acres.

Ordinarily in low water there is approximately 3 feet of water on the shallowest crossings from the mouth to Silver Lake, a distance of about 40 miles; from there up to Webers Falls, in Indian Territory, there is no great difference in depth, being about 16 inches on the shallowest crossings to 20 miles above Little Rock, and 12 to 14 inches from there on up. The increased depth in the lower 40 miles of the river is evidently due to the effect the backwater from the Mississippi has on this portion of the stream.

The checking of the current by this backwater causes immense deposits of material in that portion. When a concave bank wears away, the opposite point bar builds up in two or three years to near the height of the original bank, thus keeping the river bed narrow; while above where this condition exists the high concave banks wear away and the bars opposite build up very slowly, and, as a consequence, when the river rises 2 or 3 feet it spreads out until it is wider than in the lower part of the stream.

This condition of course requires more rainfall to produce a navigation depth and causes in a great many cases a
377 different channel in high and low water, leveling the bars and filling up the low-water channel to such an extent as to make it a difficult task for the low-water current to cut out its original channel.

The low-water channel as a consequence wanders between these high banks after different rises.

While engaged in snagging operations between Little Rock and Pine Bluff the snag boat Sheldon reported 19 inches over Fourche Bar October 12; 18 inches over Wild Cat October 27; 16 inches over Wrights Crossing November 1; 18 inches on Kings Bar and Wrights November 12. The Signal Service gauge at Little Rock was 3.6 feet on the first-mentioned date and 2.6 feet on the last mentioned. In May the tow-boat Cleveland (draft forward 18 inches and aft 20 inches) returned from St. Francis River and encountered considerable difficulty in reaching Little Rock? Extracts from the log are: "May 21, lost two hours on Victoria Bar; worked rest of day on Rob Roy Bar. May 22, pulled over Rob Roy Bar at 10:30 a. m.; lost two hour on Furgus Bar. May 24, all day on Kings

Bar. May 25, lost four hours on Cates Bar. May 26, can't get over Fourche Bar."

The Signal Service gauge at Little Rock read from 2.8 feet to 3 feet during the time, and all commercial navigation was suspended.

378 (Plaintiff's Exhibit 45.)

(Report of the Chief of Engineers, 1896.)

379 Office of the Chief of Engineers,
United States Army,
Washington, D. C., September 29, 1896.

Improvement of Arkansas River and of Certain Rivers in
Arkansas and Missouri

This district was in the charge of Capt. W. L. Sibert, Corps of Engineers. Division Engineers, Col. Henry M. Robert, Corps of Engineers, to December 14, 1895, and Col. J. W. Barlow, Corps of Engineers, since February 5, 1896.

1. Removing obstructions in Arkansas River, Arkansas and Kansas.—This river was, previous to improvement, seriously obstructed by snags, overhanging timber, reefs, and bars.

The original project under this head was to raise and destroy snags, cut overhanging timber, remove bowlders and reefs by blasting and dredging, and cut out sand bars by temporary wing dams. To this was later added the survey of the river with the view to permanent improvement.

Since appropriations for permanent improvement were made, blasting, dredging, and dams have been omitted from the project, leaving customary snagging operations only.

On this work there had been expended from the first appropriations in 1832 up to June 30, 1895, \$864,675.53.

The evidence of pilots and masters is that in the permanent reaches of the river the condition has been materially improved; in the shifting channels the relief is only temporary, and the obstructions to navigation are still numerous and dangerous. The best illustration of the condition is the fact that steamboats have to pay 18 per cent per annum for insurance.

The operations of the fiscal year under this appropriation have been confined to reaches of river between foot of White River Cut-off and Knotts Island, about 98 miles. Other snag-

ging operations are reported under "Improvement of Arkansas River, Arkansas." The condition of the river was materially improved for the season.

The value of the commerce reported for the fiscal year is \$2,408,720. There was \$193,907 worth of commerce for each \$1,000 expended in removing obstructions during the past year.

Snagging operations on this stream are a continuous necessity and can never be completed as long as there are caving banks and a shifting channel. The work is that of maintenance. July 1, 1895, balance unexpended. \$ 7,107.93
Amount appropriated by Act of June 3, 1896. 20,000.00

27,107.93

June 30, 1898, amount expended during fiscal year . . 6,421.87

July 1, 1896, balance unexpended 20,686.06

381

United States Engineer Office,
Mount Nebo, Ark., July 16, 1896.

General: I have the honor to forward herewith annual reports for the fiscal year 1896 of the following works of river and harbor improvement under my charge.

Very respectfully, your obedient servant,

WM. L. SIBERT,
Captain of Engineers.

Brig. Gen. W. P. Craighill,
Chief of Engineers, U. S. A.

U 1.

Removing Obstructions in Arkansas River, Arkansas and Kansas.

Object.—To remove (otherwise than by permanent works) obstructions to navigation.

Project.—Originally to raise and destroy snags, cut overhanging timber, remove bowlders and reefs by blasting and dredging, and to cut out sand bars by temporary wing dams. The survey of the river with a view to project for permanent improvement was included under this head.

Since appropriations for permanent improvement were made, blasting, dredging, and dams have been omitted from

the project under this head, leaving the customary snagging operations only.

Operations of Previous Years.

The first snagging operations were under the act of July 3, 1832. The work began August, 1833, and February 18, 1834, is said to be the date of arrival of the first snag boat, Archimedes, at Little Rock. Of the work done prior to 1868 I am unable to give any information.

Abs

382 Abstract of work done, 1868 to 1895, inclusive.

Fiscal year	Snags removed	Trees cut	Trees deadened	Drift piles removed	Between
1868	134				Mouth and Douglass landing,
1869	50	1			(?)
1870	805	114			(?)
1871	1169	5925			Mouth and Illinois Bayou.
1872	542	257		2	Mouth and Pine Bluff
1873	110	44			Little Rock and Bentleys Bar
1875	663	1570		23	Mouth and Fairdale
1876	545	1274		5	Mouth and (?)
1877	193	234		3	Mouth and Silver Lake
1878	430	1177		11	Mouth and Little Rock
1880	750	488		19	Mouth and Trustee Bend.
1881	391	346		23	Little Rock and Webbers Falls
1882	976	3460		18	Mouth and Fort Smith
1883	1287	786		8	Do.
1884	1118	1135		8	Mouth and Fort Gibson
1885	2244	14325	17	20	Mouth and near Pawnee Agency
1886	109	14		2	Mouth and Little Rock.
1887	1385	143			Mouth and Fort Smith
1890	552	231			Little Rock and Webbers Falls
1891	300	2000	13000		Little Rock and Mouth
1892	787	544		4	Mouth and Webbers Falls
1893	862	670		17	Pine Bluff and Dardanelle
1894	387	1346		1	Little Rock and Hog Thief Bend
1895	1154	2602		19	Foot of cut-off and Ives Point

During the time covered by the above abstract three snag boats have sunk while in service, the Northwest at Stanleys in fiscal year 1868, the Thayer at Bentleys Bar in fiscal year 1873, and the Pioneer at Hughes Bend in fiscal year 1893.

The records of the Northwest were lost when the boat sunk, hence her work is not included in that of 1868.

Operations of this Fiscal Year.

The work under this appropriation this year was confined to reaches of river between foot of cut-off and Knotts Island, about 98 miles. The amount of work done under this head is shown in table below:

Month	Snags removed	Trees cut	Drift piles broken up.	Between
August	49	3	6	Douglass and South Bend
September	54	141	4	Foot of cut-off and Samples
October	277	175	21	Foot of cut-off and Frog Bend landing.
November	346	19	14	Sandy Bayou and Cummings.
December	75	551		Waddells and Knotts Island
	801	889	45	

383 Other snagging operations are reported under the head "Improvement of Arkansas River, Arkansas."

Progress of Work.

The Arkansas River has in the State of Arkansas about 370 miles of caving banks; most of the bars are built upon and many of the channel crossings are over rock heaps. The caving banks make continual contributions of snags; the wearing away of sand bars brings the older accumulations into the channel, and removing snags from the crossings allows the sand to wash and expose others. All of these go to make snagging operations a continuous necessity.

The evidence of pilots and masters is that in the permanent reaches of the river the condition has been materially improved; in the shifting channels the relief is only temporary.

In the lower reaches of the Arkansas River its current is checked by the floods of the Mississippi; the snags and logs drifting toward that stream are deposited in the bed of the Arkansas in all conceivable shapes. In the absence of current the snags make no "breaks," consequently the dangers to navigation are greatly increased.

Snagging operations will be necessary as long as there is a caving timbered bank and a shifting channel; they should not be diminished for many years, and could profitably be increased.

Appropriations and Expenditures.

Appropriations for operating snag boats on the Arkansas River have been made intermittently since 1832. Many of the early appropriations were combined with those of other rivers without stated distribution of funds. The estimate of expenditures is not given as absolute, but as a close approximation.

July 3, 1832, (less \$38.00 carried to surplus fund) ..	\$14,962.00
March 3, 1835	40,000.00
March 3, 1837	25,000.00
July 7, 1838 (less \$1,115.66 carried to surplus fund)	38,884.34
From appropriations 1842-1844 (estimate)	80,000.00
August 30, 1852 (less \$269.47 carried to surplus fund)	39,730.53
From appropriations 1866-1878 (disbursements reported by Colonel Suter)	344,831.59
March 3, 1879 (part)	30,000.00
June 14, 1880 (part)	35,000.00
March 3 1881 (part)	25,000.00
August 2, 1882	35,000.00
July 5, 1884	36,000.00
384 August 5, 1886	19,875.00
August 11, 1888	25,000.00
September 19, 1890	20,000.00
From sale of Reese	20,000.00
July 13, 1892	20,000.00
From sale of Missouri	2,500.00
August 17, 1894	20,000.00
June 3, 1896	20,000.00
Total	891,783.46
Expended to June 30, 1895	864,675.53

Money statement.

July 1, 1895, balance unexpended	7,107.93
Amount appropriated by act of June 3, 1896	20,000.00
	<hr/>
	27,107.93
June 30, 1896, amount expended during fiscal year	6,421.87
	<hr/>
July 1, 1896, balance unexpended	<u>20,686.06</u>

(Amount (estimated) required for work annually..	35,000.00
(Amount that can be profitably expended for	
maintenance in fiscal year ending Jun 30,	
1898	35,000.00

Submitted in compliance with requirements of sections 2 of river and harbor acts of 1866 and 1867 and of sundry civil act of March 3, 1893.

385

Channel.

The Arkansas River is a stream whose bed and banks are to a great extent composed of a sandy loam. This material is eroded very easily, and as a result the channel of the stream is continually changing, the concave banks wearing away and the opposite point bars building out.

From Little Rock to the mouth (173) miles) the river valley is entirely alluvial, and the entire bank is liable to cave is attacked by the water. Above Little Rock the conditions are the same, except at those places where the stream runs next to the hills that jut out into the valley. Even though the valley be very narrow, the character of the bottom land is the same.

From the data in the possession of this office, which is not very complete, the average amount of bank caved in per mile per year from Little Rock to the mouth is about a7.64 acres; from Little Rock above about 1.99 acres.

Ordinarily, in low water there is approximately 3 feet of water on the shallowest crossings from the mouth to Silver Lake, a distance of about 40 miles. From there up to Webbers Falls, in Indian Territory, there is no great difference in depth, being about 16 inches on the shallowest crossings to a 20 miles above Little Rock, and 12 to 14 inches from there on up. The increased depth in the lower 40 miles of the river is evidently due to a gentler slope and to the effect the backwater from the Mississippi has on this portion of the stream.

The checking of the current by this backwater causes immense deposits of material in that portion. When a concave bank wears away the opposite point bar builds up in two or three years to near the height of the original bank, thus keeping the river bed narrow, while above where this condition exists, the high concave banks wear away and the bars opposite build up very slowly, and as a consequence, when the

river rises 2 or 3 feet, it spreads out until it is wider than in the lower part of the stream.

386 This condition, of course, requires more rainfall to produce a navigable depth, and causes, in a great many cases, a different channel in high and low water, leveling the bars and filling up the low-water channel to such an extent as to make it a difficult task for the low-water current to cut out its original channel.

The low-water channel, as a consequence, wanders between these high banks after different rises.

A quick rise of 20 or more feet in the river, followed by a rapid fall, leaves on many crossings not over $2\frac{1}{2}$ or 3 feet with gauge readings at 10 or 12 feet. Last December there was one of these rises, the river changing from 3.5 on the gauge, December 20, to 17.2, December 21, and to 23.2 on December 27. The river began falling December 29, and on January 7 had fallen to 12.7 on the gauge.

The Beauregard on that day found only 24 inches on the crossing at Meades Point, where there had been 3 feet before the rise began.

The next day the channel had shifted a full quarter mile to the left, and 6 feet was found in it. In the latter part of June the river was slowly falling or practically stationary at 6 feet on Little Rock Gauge, and at this stage 2 feet draft was all that could be taken from Swan Lake (27 miles below Pine Bluff) to Dardanelle.

387 The Government here introduces in evidence Exhibit 46, being report of Chief of Engineers for year 1897, which reads as follows, to-wit:

388 Exhibit 46.

“Office of the Chief of Engineers,

United States Army,

Washington, D. C. September 30, 1897.

“Sir: I have the honor to present for your information the following report upon the duties and operations of the Engineer Department for the fiscal year ending June 30, 1897:

• • • • •

“Improvement of Arkansas River and of Certain Rivers in
Arkansas and Missouri.

Report of Capt. William L. Sibert, Corps of Engineers, Of-
ficer in Charge, for the Fiscal Year Ending June 30,
1897, with other Documents Relating to the Works.

Improvements.

- | | |
|--|---|
| 1. Removing obstructions
in Arkansas River, Ar-
kansas and Kansas. | 4. Black River, Arkansas
and Missouri. |
| 2. Arkansas River, Ar-
kansas. | 5. Current River, Ar-
kansas and Missouri. |
| 3. White River, Arkansas. | 6. St. Francis River, Ar-
kansas. |
| | 7. St. Francis River, Mis-
souri. |

Examination.

8. Neosho River, Kansas.

Surveys.

- | | |
|--|---|
| 9. Arkansas River at Little
Rock Van Buren and
Fort Smith, Arkansas. | 11. White River, Arkansas. |
| 10. Arkansas River at Pine-
bluff, Arkansas. | 12. Buffalo Fork of White
River, Arkansas. |
| | 13. St. Francis River
Arkansas and Missouri. |

United States Engineer Office.

Mount Nebo, Ark., July 15, 1897.

General: I have the honor to forward herewith annual
report for the fiscal year 1897 of the following works of river
and harbor improvement under my charge.

• • • • •
Very respectfully, your obedient servant,

WM. L. SIBERT,
Captain of Engineers.

Brig. Gen. John M. Wilson,
Chief of Engineers, U. S. A.

"V. 1.

Removing Obstructions in Arkansas River, Arkansas
and Kansas.

Object: To remove (otherwise than by permanent works)
obstructions to navigation.

Project: Originally to raise and destroy snags, cut over-
hanging timber, remove bowlders and reefs by blasting and
dredging, and cut out sand bars by temporary wing dams.
The survey of the river with a view to project for permanent
improvement was included under this head.

Since appropriations for permanent improvements were
made, blasting, dredging, and dams have been omitted from
the project under this head, leaving the customary snagging
operations only.

• • • • •

"Commerce.

"The commerce of this stream is reported under the head
'Improvement of Arkansas River, Arkansas.'

V 2.

Improvement of Arkansas River, Arkansas, Original Con-
dition.

"In addition to such obstructions as snags, the channel of
the river was for nearly all of its length of a shifting charac-
ter and was obstructed by sand bars fed by caving banks. In
the upper reaches there were some reefs of rock.

Originally Adopted Projects and Additions.

Prior to 1886 works upon this river were special improve-
ments of detached reaches, generally with immediate refer-
ence to confining the channel to drawspans of bridges or the
water fronts of towns, and to the improvement of some espec-
ially difficult crossing.

The project and estimate for the improvement of the
390 whole river was made in three parts: Annual Report
Chief of Engineers, 1885, page 1603, for improving Ar-
kansas River from Little Rock to mouth, \$2,538,544; Annual
Report Chief of Engineers, 1888, page 1386, for improvement
between Fort Gibson and Little Rock, at a cost of \$1,307,935,
and House Ex. Doc. No. 90, Forty-ninth Congress, first ses-
sion, for improvement between Arkansas City, Kans., and

Fort Gibson, \$1,696,900. The act of August 11, 1888, adopts a project for improving Arkansas River from Wichita, Kans., to the mouth, mentioning distinctly the plans, which include the estimates from Little Rock to the mouth and from Fort Gibson to Arkansas City, Kans., and by implication approves the estimate for improvement between Little Rock and Fort Gibson. No estimate has ever been made or approved for the improvement of the river between Arkansas City, Kans., and Wichita, Kans.

The estimates for improving the reach from Little Rock to the mouth and from Little Rock to Fort Gibson were based upon an improvement by permeable dikes alone, and by dredging, whereas, the act of August 11, 1888, authorizes the application of any of the methods set forth in the projects for the three reaches at such points between Wichita, Kans., and the navigable mouth of the Arkansas River as the Secretary of War may direct.

The application of those approved methods that have been most effective will largely increase the estimate for improving the reaches between Fort Gibson and Little Rock and between Little Rock and the mouth. Under date of August 29, 1896, authority was granted for calling the estimate for completing the project for improving the Arkansas River from Wichita, Kans., to the mouth "indefinite."

391

Present Approved Project.

To remove rock and gravel reefs by blasting and dredging, to contract the channel by dikes or dams, permeable or solid, of such construction as the local conditions require, and to hold the channel so obtained by revetment, where necessary, from Wichita, Kans., to the mouth, the object being to secure a channel not less than 6 feet in depth from Little Rock to Mississippi River, via White River Cut-Off, and not less than 2 feet in depth above Little Rock, Ark.

* * * * *

Channel and Results of Work.

The Arkansas River is a stream whose bed and banks are to a great extent composed of a sandy loam. This material is eroded very easily, and as a result the channel of the stream is continually changing, the concave banks wearing away, and the opposite point bars building out.

From Little Rock to the mouth (173 miles) the river valley is entirely alluvial, and the entire bank is liable to cave if at-

tacked by the water. Above Little Rock the conditions are the same, except at those places where the stream runs next to the hills that jut out into the valley. Even though the valley be very narrow, the character of the bottom land is the same.

From the data in the possession of this office, which is not very complete, the average amount of bank caved in per year from Little Rock to the mouth is about 7.64 acres; from Little Rock, above, about 1.99 acres.

Ordinarily, in low water there is approximately 3 feet of water on the shallowest crossings from the mouth to Silver Lake, a distance of about 40 miles. From there up to Webbers Falls, in Indian Territory, there is no great difference in depth, being about 16 inches on the shallowest crossings to 20 miles above Little Rock, and 12 to 14 inches from there on up. The increased depth in the lower 40 miles of the river is evidently due to a gentler slope and to the effect the backwater from the Mississippi has on this portion of the stream.

The checking of the current by this backwater causes immense deposits of material in that portion. When a concave bank wears away the opposite point bar builds up in two or three years near the height of the original bank, thus keeping the river bed narrow, while above, where this condition exists, the high concave bank wears away and the bars opposite built up very slowly, and as a consequence, when the river rises 2 or 3 feet, it spreads out until it is wider than in the lower part of the stream.

This condition, of course requires more rainfall to produce navigable depth, and causes, in a great many cases, a different channel in high and low water, leveling the bars and filling up the low-water channel to such an extent as to make it a difficult task for the low-water current to cut out its original channel.

The low water channel, as a consequence, wanders between these high banks after different rises.

Prior to fiscal year 1895, works upon this river were for the improvement of detached reaches. Some of these works gave satisfactory results, others were not kept in good repair, and the improvement in the channel was only temporary. In relation to each other the works were remote and there was no increase of channel depth for a length of river sufficient for a steamboat trade. Beginning with the fiscal year 1895, effort

has been made to work systematically over a reach of river of sufficient length to be of some benefit to navigation. The amounts appropriated have been small in comparison
 393 with the amounts of work proposed in the project and the length of river believed to be permanently improved is not let large. It is believed that a low-water depth of 2 feet 6 inches to 3 feet has been obtained over the crossing in the first 21 miles above Little Rock. These crossings formerly had on them lot-water depths of 14 to 18 inches. The plan followed in the improvement of this 21-mile reach has been that of holding the concave side of the bends with revetments and of holding the head of the bars below the bends with dikes. No attempt has been made to contract the water widths by works on both sides of the stream, as it is believed that by holding the concave banks and the head of the bars below the river will narrow itself, both in the bends and on the crossings.

The results obtained in this reach of river seem to warrant a continuance of the work. Work of this character can be carried on more economically where there are funds in sufficient quantity available to enable the engineer in charge to take advantage of the work done by the river itself. The banks of the Arkansas River cave rapidly and the various bends and crossing assume all kinds of shapes in a few years.

The first essential in regulation work being permanency of bends and crossings, and since the resultant increase of depth depends largely on the shape of bends and crossings, it follows that to obtain the greater result in the improvement of a certain reach of river for the least money, that the engineer should be able to protect and hold the various bends and crossing just at the time when the river itself has given them the best shape.

* * * * *

394

"Commercial Statistics.

There are no 'long trade' packets on this river, except by boats between Pine Bluff and Memphis, Tenn. Boats out of Fort Smith ply the river down to Roseville and up to Webbers Falls. The Little Rock boats go to Dandanelle and Roseville above and to Pine Bluff and Cummings below. The trips to Pine Bluff and below are made only when freights are assured them. The river trade from Pine Bluff to Memphis is handled by a packet line out of Memphis, Tenn., that endeavors to navigate the river the year round.

The results of thorough snagging operations show, in the present commerce report, in the increased amount of timber transported. Navigation having been made easier, timber men have no difficulty in finding towboats to come into the river to handle their material. The greater portion of the timber taken from this stream is for northern and eastern markets. The cooperage stuffs go to New Orleans for export. There is a slight increase in the amount of plantation products, which would be still further increased had report of the commerce centering at Fort Smith been received. Railroads closely follow the river throughout its entire length, and the freight rates on the railways are influenced to a great extent by the river."

- 395 The Government here introduces in evidence Exhibit 47, being Notes of and report of Chief Engineer of Improvement of Arkansas River; of Rivers in the State of Arkansas, and the Black St. Francis, and Little Rivers in Arkansas and Missouri, of 1889, which reads as follows, to-wit:

Exhibit 47.

Office of the Chief of Engineers,

United States Army,

Washington, D. C., Sept. 30, 1889.

Improvement of Arkansas River; of Rivers in the State of Arkansas, and the Black, St. Francis, and Little Rivers, in Arkansas and Missouri.

Officer in charge, Capt. H. S. Taber, Corps of Engineers.
Division Engineer, Col. C. B. Comstock, Corps of Engineers.

3. removing obstructions in Arkansas River, Arkansas.—Prior to the first improvements in 1831, shifting sand-bars, numerous drift-piles, and dangerous snags, constituted the obstacles to navigation in the lower reaches, and gravel and rock shoals, with a few snags and many overhanging trees, constituted those of the upper. Except for a few special reaches like the Fort Smith and Pine Bluff, the general plan of improvement has consisted in snagging operations, including the cutting of overhanging trees, in building wing-dams to improve the shoals, and in surveys looking toward plans for its permanent improvement.

The appropriations to June 30, 1889, amount to \$465,351.87. Of this there had been expended to June 30, 1888, \$367,477.89.

During the fiscal year ending June 30, 1889, \$13,090.79 was expended in the construction of a new hull for the snag-boat Wichita and care of property and records. The water was not at a suitable stage for economical work after the completion of the snag-boat.

The building of another light-draught snag-boat, after the model of the new Wichita, is recommended.

The removal of obstructions will be continued with the amount on hand and the work on the maps will be completed.

X 4.

Improving the Arkansas River, Arkansas:

Work during the past season has been carried on under two acts of Congress. By act approved August 5, 1886, \$75,000.00 was appropriated under this head, its distribution being indicated in the following words and figures:

Improving the Arkansas River, Arkansas: Continuing improvement, according to the plans and recommendations in Appendix V 13, Executive Document No. 1, 49th Congress, of which there are to be expended \$8,000 at Pine Bluff, \$13,000 at Fort Smith and \$10,000 at Dardnelle, or so much thereof under these sums, respectively, as may be necessary at these points.

The approved project for the expenditure of these sums may be summarized as follows:

At Pine Bluff the \$8,000 is to be used in extending and repairing the dikes; a portion of it to be held as a contingent to watch the action of the river; the idea being to cause the river to become less and dangerous to the town front.

At Fort Smith the \$13,000 to be expended in erecting a permeable dike a little above the town and upon the opposite side of the river, so as to contract the channel and prevent it from leaving the city wharves.

At Dardanelle the \$10,000 is to be expended in erecting a permeable dike above and opposite the town, in such position as to remove the sand-bar now in front of the wharves.

From Little Rock to the mouth, the balance, and so much as may not be required at the three places above specified, to be expended in the erection of permeable dikes at the worst places, looking towards the permanent improvement of the river, to give an all-year-round depth of water of at least 5

feet at extreme low water; these dikes to serve as contraction works, but in no instance is violent contraction to be attempted. All the dikes referred to in these projects to be about 12 feet in height above mean low water.

398 The Government here offered in evidence as Exhibit 48 the following from page 2034 of report of chief of engineers for 1899, which reads as follows, to-wit:

399 "Commercial statistics. The steamboats report the river navigable all the year ending June 1, 1899. Sixteen inches is the shoalest report between Fort Smith and Webbers Falls, 24 inches between Dardanelle and mouth of river. Navigation was stopped by ice from February 6 to February 19, 1899, both dates inclusive.

List of vessels that navigated Arkansas River, Arkansas, from May 31, 1898, to June 1, 1899.

Name	Ton- nage	Draft		Loaded Barges	Between	Round Passen- trips	Passen- gers
		Ft.	in.				
Irma	131	3	0	3	0	Little Rock and Eagles	17
						Little Rock and Roseville	34
						Little Rock and Stouts	1293
						Little Rock and Fourche	4
C. E. Taylor	50		22	2	6	Out of Little Rock	5
L. E. Patton	92	3	0	4	0	Cut off and Arkansas City	7
J. P. Gage	198	2	0			Dardanelle and	
						Carden Bottom	1
Dewey No 2		2	0			Little Rock and	
						Fourche le Fevre	40
Myrtle Corey	10	2	0	3	0	Little Rock and	
						Ross Hollow	20
Choctaw	149	4	0	4	0	Little Rock and Stouts	150
J. N. Harbin	341	3	6			Memphis and Pine Bluff	9
W. H. Grapevine	220	3	6			do	17
Lucille Newland	472	5	0			do	1040
Dardanelle	160	3	0	3	0	do	7
						Little Rock and Pine Bluff	120
Myrtle B	47	2	2			Little Rock and	168
						Garden Bottom	
						Fort Smith and	44
						Webber Falls	413
Alarm	189	5	0	7	0	Fort Smith and Piney	42
						New Orleans to Douglas	1
						New Orleans to Cummings	1
Crescent	240	5	3	6	0		

- 400 The Government here introduces as evidence Exhibit
49, being House Executive Document No. 150, 56th Con-
gress, 2nd Session, which is as follows, to-wit:
- 401 56th Congress, House of Representatives Document
2d Session. No. 150.
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Examination and Survey of Arkansas River.

Letter

From

The Secretary of War.

Transmitting,

With a Letter From the Chief of Engineers, Report of Ex-
amination and Survey of Arkansas River.

December 8, 1900—Referred to the Committee on Rivers and
Harbors and ordered to be printed.

War Department,

Washington, December 7, 1900.

Sir: I have the honor to transmit herewith a letter from the
Chief of Engineers, United States Army, dated December 6th
instant, together with report of a Board of Engineers, dated
November 23, 1900, of an examination and survey of Ar-
kansas River, with a view to its permanent improvement,
made in compliance with the river and harbor act of March
3, 1899.

Very respectfully,

ELIHU ROOT,
Secretary of War.

The Speaker of the House of Representatives.

Office of the Chief of Engineers,
United States Army,

Washington, December 6, 1900.

Sir: The river and harbor act of March 3, 1899, in the item of appropriation for improvement of the Arkansas River, contains the following provision, viz:

The President is authorized to appoint a Board of three from the Corps of Engineers, whose duty it shall be to thoroughly examine the Arkansas River and report as soon as practicable to the Secretary of War such plan for the permanent improvement of said river as in their opinion is most feasible and best adapted to the necessities of commerce, together with a statement as to the usefulness of such improvement to navigation and its relation and value to commerce. They shall also report the details of such plan, with estimates of the cost thereof.

The Board constituted in accordance with the above-quoted provision consisted originally of Lieut. Col. Amos Stickney, Capt. W. L. Sibert and Capt. Robert McGregor. Sub-
402 sequently, in June, 1899, Capt. H. C. Newcomer was substituted for Captain Sibert, and in January, 1900, Capt. C. L. Potter was substituted for Captain Newcomer. I now have the honor to submit the accompanying copy of the Board's report, dated November 3, 1900, with maps, upon the subject.

The Board in its report divides the river into three general sections, namely: First section, from its source in Colorado to the mouth of Grand River (about 1,000 miles); second section, from Grand River to Little Rock (287 miles); third section, from Little Rock to its mouth (173 miles).

1. From its source in Colorado to the mouth of Grand River.—From the facts presented in the report the Board states that any project for obtaining continuous navigation on this part of the river, if possible, would entail great expense and be of doubtful value; that such projects, if formed, would be useless until the lower portion of the river shall have been improved, and, in its opinion, the question of the feasibility and the value to commerce of such improvement may well be left to future consideration. It is stated in this connection that the mouth of the Grand River has always been considered as the head of navigation on the Arkansas River and that attempts at navigation above that point have been of rare occurrence and soon abandoned. The river between Wichita

and the Grand is crossed by 19 fixed bridges and by two fixed dams.

2. From Grand River to Little Rock.—The Board is of opinion that open-river channels can be obtained in this section although they would, necessarily be small, and in the upper part of the reach very shallow during low-water seasons and of doubtful utility at such times. The plan presented for improvement for open-river navigation contemplates the probable attainment of channels 300 feet in surface width, with mean depths at ordinary lowwater of 4.5 to 5 ft. at Little Rock, 4 to 4.5 feet at Dardanelle, 3 to 3.5 feet at Fort Smith, and 2 to 2.25 feet at mouth of Grand River. For a large part of the year all of the depths would be greater and the channels wider, and for short periods at long intervals they would be less. The estimates of cost, by reaches, are as follows:

Little Rock to Dardanelle (88 miles)	\$4,468,825
Dardanelle to Fort Smith (106.3 miles)	5,585,875
Fort Smith to mouth of Grand River (93.1 miles)	5,226,225
Total	15,280,925

The Board states that a channel depth of 6 feet can be obtained in this section by the construction of 33 locks and dams, estimated to cost, including bank protection, \$26,677,200, and that careful surveys would be required for the definite location of the various works, whether the method of improvement be by open-channel work or by the slack-water system.

3. From Little Rock to the mouth of the river.—It is the opinion of the board that the construction and maintenance of locks and dams in this section would be hazardous and very costly; that any improvement made should be for open-river navigation, and that by the latter method channels can be obtained of not less than three hundred feet in width, with a mean depth of about 5 feet and a central depth of about 7 feet in ordinary low water. For a large part of the year such channels would be wider and deeper. The estimates of cost, by reaches, for open-river navigation are as follows:

Mouth to Pine Bluff (108 miles)	\$6,213,475
Pine Bluff to Little Rock (66 miles)	3,769,000
Total ..	9,982,475

Add to this the estimated cost of improvement from
 Grand River to Little Rock, viz 15,280,925

Grand total of cost for open-river improvement 25,263,400

In addition to the complete formation and maintenance of channels, the constant removal, at least for many years, of the snags formed by the enormous quantity of drift that passes down the river would be absolutely necessary for the safety of navigation. For this purpose a properly equipped light-draft steel-hull snag boat should be provided at a cost estimated at \$75,000, and provision made for its operation and maintenance, estimated to cost \$25,000 per year.

It is the opinion of the Board that any work of improvement should be done in reaches of continuous work, beginning with the work in each reach at the head of said reach, and it emphasizes the statement that satisfactory results and economy in cost can not be obtained except by continuous work, the estimates being based upon such method and upon provision of funds by yearly appropriations of sufficient magnitude to keep a working plant in continuous operation.

Attention is respectfully invited to the statements by the Board in regard to the usefulness of the improvements to navigation and its relation and value to commerce.

Very respectfully, your obedient servant,

JOHN M. WILSON,
 Brig. Gen., Chief of Engineer,
 U. S. A.

Hon. Elihu Root,
 Secretary of War.

Examination and Survey of Arkansas River with a View to
 Its Permanent Improvement.

St. Louis, Mo., November 23, 1900.

General: The Board of Engineer Officers appointed by direction of the President, in accordance with the provisions of the river and harbor act of March 3, 1899 to examine the Arkansas River and report a plan for its permanent improvement, has the honor to submit the following report:

The Board met at Little Rock, Ark., June 8, 1899, pursuant to the following order:

Special Orders, Headquarters Corps of Engineers,
 United States Army,
 Washington, March 11, 1899.

[Extract.]

1. By direction of the President, a board of officers of the Corps of Engineers is hereby constituted, in accordance with provisions of the river and harbor act of March 3, 1899, to consist of Lieut. Col. Amos Stickner, Capt. William L. Sibert, First Lieut. Robert McGregor, to assemble at Little Rock, Ark., at as early a day as practicable, upon the call of
404 the senior, to examine the Arkansas River and report plan for the permanent improvement of said river.

Upon the completion of the duty assigned them the members of the Board will return to their proper stations.

The journeys required under this order are necessary for the public service.

* * * * *

By command of Brig. Gen. Wilson:

JOSEPH E. KUHN
Captain Corps of Engineers.

The membership of the Board was changed by Special Orders, No. 33, Headquarters Corps of Engineers, United States Army, Washington, June 15, 1899, substituting Capt. H. C. Newcomer, Corps of Engineers, United States Army, for Captain Sibert, and again by Special Orders, No. 2, Headquarters Corps of Engineers, United States Army, Washington, January 9, 1900, substituting Capt. C. L. Potter, Corps of Engineers, United States Army, for Captain Newcomer.

The duties of the board were further outlined in the following extract from river and harbor act of March 3, 1899, viz:

The President is authorized to appoint a Board of three from the Corps of Engineers, whose duty it shall be to thoroughly examine the Arkansas River and report as soon as practicable to the Secretary of War such plan for the permanent improvement of said river as in their opinion is most feasible and best adapted to the necessities of commerce, together with a statement as to the usefulness of such improvement to navigation and its relation and value to commerce. They shall also report the details of such plan, with estimates

of the cost thereof. The cost of such examination and survey and the expenses of said Board shall be paid out of the sum above appropriated.

At the first meeting the Board organized and examined the data with a view to supplying any deficiencies. Arrangements were made to supplement the information already rangements were made to supplement the information already on hand by gauge readings and low-water discharge observations for the season of 1899.

The second day the Board made an examination by steamer of the works of improvement constructed under the existing project for the river in the vicinity of Little Rock.

On August 21 the Board took steamer at Dardanelle and examined the river from there to the mouth, a distance of 261 miles. Four days were consumed in this examination.

On October 23 the Board assembled at Wichita, Kans., examined the river at that point and at numerous other accessible points down to Tamaha, 418 miles above the mouth. From this point the Board continued the journey down the river to Dardanelle on a quarter boat, pushed by a very small steamer. It was the intention to take the steamer at Fort Gibson, Ind. T., which is the head of navigation for light-draft boats; but the slow progress of the boat, owing to low water, made it necessary to meet her further down. The examination of this part of the river from Wichita consumed nine days.

Sources of data regarding the river.—In addition to the personal examinations by the Board of 771 miles of the river the following sources of information were available.

United States Geological Survey, sources of river to Wichita, Kans.—The Geological Survey has compiled considerable hydrographic and other data regarding the river above Wichita, Kans., which appears in the annual reports of the Survey.

Wichita, Kansas, to mouth of Grand River (Fort Gibson, Ind. T.).—Survey by F. S. Burrows, assistant engineer, 1884; published in House Ex. Doc. No. 90, Forty-ninth Congress, first session.

405 Mouth of Grand River to Little Rock,—Survey by S. T. Abert, assistant engineer, 1870; published in House Ex. Doc. No. 295, Forty-first Congress, second session.

Little Rock to the mouth.—Survey by Charles E. Taft, assistant engineer, 1885; published in Report of the Chief of Engineers, 1885, page 1604.

Report of the Board of Engineers on improvement of the Arkansas River from Wichita, Kans., to its mouth, March 16, 1888; published in Annual Report of the Chief of Engineers, 1888, page 1389.

Gauge records of the Mississippi River Commission.—Records of daily gauge observations by the United States Weather Bureau as follows: At Little Rock, Ark., since January 1, 1872; at Dardanelle, Ark., since January 1, 1890; at Fort Smith, Ark., since June 1, 1882, and at Webber Falls, Ind. T., since July 14, 1898.

In addition to the above the records of the United States engineer office at Little Rock furnished comparative surveys of 10 detached reaches of the river, showing improvements undertaken, results accomplished, and present condition. Records of gauge observations, discharge measurements, and observed channel depths were also available and were supplemented by observations during the season of 1899.

Geography and physical characteristics.—The Arkansas River, rising in Tennessee Pass, in the central part of Colorado, and flowing in a general southeasterly direction to the Mississippi River, has a length of about 1,460 miles, of which 350 are in Colorado, 400 in Kansas, 340 in Oklahoma and the Indian Territory, and 370 in the State of Arkansas.

According to the reports of the Geological Survey, in the upper portion it is a torrential mountain stream, with a fall of nearly 5000 feet in the 120 miles from Leadville to Canyon City. From here the river traverses the arid districts of Colorado and Kansas with a much diminished slope, reenforced by numerous tributaries of the same general nature, but giving up much of its water for the purposes of irrigation, and often losing itself in the sand until the bed becomes entirely dry. Wichita, Kans., the upper limit of the existing project for improvement, is on this portion of the river, 771 miles above the mouth.

In the Indian Territory the Arkansas River receives a number of important tributaries, among which are the Cimarron, the Verdigris, the Grand, and the Canadian. From observations made under direction of the board during the past season, the Grand would seem to be the most important tributary as regards steady low-water flow. Fort Gibson, on the Grand River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, has always been considered the head of river navigation. From the Canadian to the mouth of the Arkansas, 424 miles, there are no tributaries that add much

to the low-water volume of flow, but the low-water discharge of the river increases gradually, receiving water from a narrow drainage valley, through small rivers and creeks, and by infiltration. The slope of the river undergoes an abrupt change at the Grand River. Above that point, for the 82 miles to the Cimarron, the average slope is 2 feet per mile. Below the Grand the slope is but 1.2 feet per mile in the first 37 miles, and diminishes from there on. The physical characteristics of the river from the Grand to the mouth vary considerably in the upper and low reaches, the dividing point being about at Little Rock. Above this point the erosion of the banks is much less than below. The curvature is considerably less than below, and the alluvial banks are interrupted at numerous points by rock bluffs.

406 Below Little Rock the river is winding, the banks rapidly caving, and cut-offs have been numerous. There is but one point where there is a low cropping of rock. From Little Rock to a point about 80 or 90 miles above the mouth evidences of the effect of the enormous floods are everywhere present in the form of the bed. The river is wide between banks, which causes numerous high middle bars, with the low-water flow subdivided at places into several channels. In the lower 80 or 90 miles, however, the river is much narrower between banks, and, while the banks are caving and cut-offs not unknown, there is a marked change in the appearance of the bed. The form of the banks and bars is regular, and there is an entire absence of middle bars. This conditions is doubtless due to the effect of backwater from the Mississippi River and the general overflow of the banks to a considerable depth during floods, causes which produce great reduction of flood velocity in the river bed. Swan Lake is about the point where this change of condition begins.

The Arkansas River enters the Mississippi through two mouths. The lower of these, usually called the "mouth of the Arkansas," is 15.6 miles long, and discharges only during high water. The upper of these mouths, which is 12.4 miles long, takes all the flow during low water and a varying proportion of it at high stages. The White River enters this branch 7.7 miles above the Mississippi. For this reason this mouth is generally known as the "mouth of White River," that part of the branch above the entrance of White River being known as the "Cut-off." This designation appears to have been given by the steamboat men. If the union of the two rivers was ever made by a cut-off it has lost all appearance of it, and the early French explorers all agree in describing the Arkansas

as having two mouths, of which the upper (mouth of White River) was the most important. The White River is described as emptying into the Arkansas.

For discussion the river will be divided into three sections, as follows:

First section, source to Grand River, about 1,000 miles.

Second section, Grand River to Little Rock, 287 miles.

Third section, Little Rock to mouth of river, 173 miles.

Before entering upon a discussion of the various sections, however, it will be necessary to call attention to the measurements of the river's stages and flow.

Discharge Measurements, Stages of River, Etc.

There are no extended records of discharge measurements on the river except at Little Rock and Pine Bluff. There are limited records of measurements made at Fort Smith and a few other points, including those recently made for the board during the low-water season of 1899. The problem of improvement for navigation, however, has mostly to do with low-water flow, and as there is no tributary between the mouth of the Grand and the mouth of the Arkansas that adds largely to the low-water flow of the latter, the quite extensive measurements of the river at Little Rock, together with the occasional measurements at other points, will permit of pretty close approximations to the low-water conditions at all points below Grand River. Above Grand River, as will be shown further on there is sufficient general information for the purposes of this report. The Little Rock gauge records and discharge measurements therefore assume great importance, and they have received careful study.

407 The United States Engineer gauge at Little Rock, established by Colonel Merrill January 1, 1872, was on January 1, 1899, removed from its location at the levee to the Baring Cross Bridge site, about 1 mile upstream. The Signal Service on July 1, 1879, took possession of the abandoned Merrill gauge.

During the year 1879 the Baring Cross gauge recorded nearly the same stages, at least for low water, as the Merrill gauge. The former was presumably set by equal readings, but more probably the equality was obtained by subtraction of a constant number.

Until about August, 1886, the Baring Cross gauge was not maintained at a constant zero, or at least the readings were not referred to the same zero.

The printed stages of Mississippi River Commission of the Little Rock United States Engineer gauge previous to August, 1886, are erroneous so far as concerns their reference to a fixed datum. The readings at various times referred to zeros, which varied from 2 to 3 feet in height.

The United States Signal Service, or the Weather Bureau, has maintained a gauge at Little Rock since July 1, 1879; it has occupied at least three different locations, but Captain McGregor, United States Engineers, has reduced all the records to a constant zero and locality.

From these records and the published stages of the Baring Cross United States Engineer gauge a gauge relation has been platted for each year from 1879 to 1889, inclusive.

Knowing the actual elevations of the zeros of both gauges for the years 1887, 1888, and 1889, the slope between the gauges at a zero stage becomes known, and, on the assumption that this slope remains constant for the zero stages of the previous years, the elevation of the zero of the upper gauge also becomes very closely approximated to.

The slope between the gauges at a zero stage appears to be 0.18 to 0.19. The distance between gauges is about 4,000 feet.

The platted relation of the gauges depends upon an average of two daily readings of the United States Engineer gauge and a single daily reading of the Weather Bureau gauge; but the number of readings is so large that errors in time are probably eliminated, and it is believed a fairly correct straight-line relation is obtained.

In this manner the following table of elevations of zeros of the United States Engineer gauge on the Baring Cross bridge has been deduced:

Zeros of Baring Cross United States Engineer gauge above Cairo datum.

January 1, 1889, to 1900, authority Mississippi River Commission	241.53
August 1, 1886, to January 1, 1889	241.5
August 1, 1885, to August 1, 1886	241.93
August 1, 1884, to August 1, 1885	242.155
August 30, 1883, to August 1, 1884	241.72
August 1, 1882, to July 20, 1883	241.72
July 1, 1881, to August 1, 1882:	
For over 4-foot stages	242.70
For under 4-foot stages	242.0

June 20, 1880, to August 1, 1881:

For over 3.4-foot stages.....	243.31
For under 3.4-foot stages.....	242.72
July 1, 1879, to June 20, 1880.....	244.72
The Merrill gauge, an average of four determinations from 1872 to 1881, inclusive.....	244.12
Reduced Weather Bureau gauge (Little Rock office).....	242.72

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408 The variation of the gauge zero as shown in the above table readily explains why the variations of low-water readings and of discharge measurements as shown by the records were very confusing. There were so many discrepancies, especially in the low-water discharge measurements, that careful study and much labor has been expended on the subject, especially on account of its great importance in considering plans for low-water improvement. This study has, it is believed, largely cleared away the discrepancies and permitted the making of deduced tables which, it is thought, more correctly represent the actual conditions of the river than the tables compiled directly from the records with variable gauge zeros. It seems to be almost beyond doubt that an occurrence not unusual in sedimentary rivers has transpired—that is, that the low-water plane at Little Rock has risen since 1879, when the lowest reading of the gauge was recorded; and by comparison of gauge heights and discharge measurements a low-water curve has been deducted. Correcting the gauge readings at the time various discharges were measured, by this low-water curve, a remarkably regular discharge curve can be constructed from the numerous discharge measurements. The following are the corrected tables for discharges and duration of stages:

Discharge of the Arkansas River, at or near Little Rock, Ark.

Date.	Surface height above new low-water plane.	Water width	Mean depth.	Area.	Average velocity per second.	Discharge.	Authority.
				Square feet.	Feet.	Cubic feet.	
1892. May 23	Feet. 27.81	Feet. 1,487	Feet. 25.4	37,710	12.11	456,565	Mississippi River Commission.
May 24 1898.	27.21	1,484	24.9	36,962	11.12	410,829	Do.
May 11	26.78	1,550	37	57,342	11.80	676,756	Do.

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May 10	26.28	1,550	36.9	57,165	10.24	585,524	Do.
May 12	26.28	1,557	37.9	58,984	11.15	657,859	Do.
May 13	25.48	1,562	36.3	56,663	9.44	535,032	Do.
1893.							
May 6	22.96	1,866	22.9	42,796	4.60	196,907	Do.
May 7	21.56	1,862	21.6	40,325	4.52	182,413	Do.
May 8	20.26	1,862	21.2	39,470	4.01	158,297	Do.
May 10	20.26	1,862	20.1	37,338	3.99	148,817	Do.
May 9	19.96	1,862	20.1	37,504	3.78	141,821	Do.
1885.							
July —	19.35	.....	.....	26,725	4.12	110,413	Little Rock office.
1888.							
May 3	17.36	.....	.....	21,063	4.99	105,094	Mr. J. C. Branner.
May 21	16.46	.....	.....	19,845	4.99	99,026	Do.
May 2	16.45	.....	.....	19,845	4.95	98,233	Do.
Apr. 16	16.45	.....	.....	19,845	4.95	98,233	Do.
May 24	16.17	.....	.....	19,480	4.76	92,725	Do.
Apr. 14	15.79	.....	.....	19,010	4.85	92,198	Do.
June 27	15.07	.....	.....	18,189	4.42	86,995	Do.
June 15	14.45	.....	.....	17,480	4.08	71,318	Do.
Mar. 28	13.40	.....	.....	16,038	4.07	65,274	Do.
Apr. 13	13.14	.....	.....	15,610	3.98	62,127	Do.
Apr. 18	12.84	.....	.....	15,451	4.25	65,667	Do.
June 16	12.49	.....	.....	15,120	3.46	52,315	Do.
Sept. 4	11.38	.....	.....	14,050	3.96	55,638	Do.
Mar. 9	11.18	.....	.....	13,869	3.58	48,651	Do.
1887.							
Dec. 7	9.88	.....	.....	12,180	3.15	38,367	Do.
1888.							
June 18	9.46	.....	.....	12,000	2.66	31,920	Do.
Mar. 6	9.22	.....	.....	11,983	3.15	37,746	Do.
Apr. 21	8.14	.....	.....	12,416	2.81	34,889	Do.
Feb. 4	7.96	.....	.....	11,403	2.93	33,410	Do.
June 23	7.24	10,815	1.96	21,197	Do.
Apr. 25	5.63	9,685	1.82	17,607	Do.
Apr. 9	5.19	9,337	2.10	19,607	Do.

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Apr. 28	4.93	9,427	1.72	16,294	Mr. J. C. Branner.
Jan. 17	4.63	9,200	1.60	14,720	Do.
Jan. 13	4.45	9,055	1.55	14,035	Do.
Aug. 29	2.80	.....	.....	8,130	.78	6,541	Do.
1886.							
Dec. 6	2.73	965	5.9	5,660	.77	4,365	Little Rock office.
1888.							
Jan. 2	2.32	.....	.....	7,832	.91	7,127	Mr. J. C. Branner.
Aug. 18	1.90	.....	.....	7,607	.87	6,618	Do.
1887.							
Oct. 3	1.72	.....	.....	7,501	.88	6,601	Do.
Oct. 8	1.42	.....	.....	7,332	.72	5,279	Do.
Nov. 8	1.12	.....	.....	7,234	.43	3,111	Do.

1894.							
Nov. 23	1.06	320	5.2	1,664	1.56	2,597	Little Rock office.
1887.							
Nov. 12	1.00	.....	.....	7,132	.37	2,639	Mr. J. C. Branner.
1899.							
Oct. 31	.89	161	5.3	802	2.87	2,300	Little Rock office.
1897.							
Oct. 20	.12	315	4.0	1,278	.91	1,160	Do.
Oct. 21	.12	351	3.5	1,223	.98	1,195	Do.
Oct. 12	.30	350	4.1	1,438	1.06	1,522	Do.
Oct. 22	.08	348	3.5	1,231	.97	1,190	Do.

Discharge of the Arkansas River near Pine Bluff, Ark.

(Referred to heights on U. S. E. gauge at Little Rock of one day earlier. The zero of this gauge was 1 foot above extreme low water of 1879. To conform to new low-water plane 1 foot should be added to gauge readings.)

Date.	Little Rock U.S.E. gauge.	Water width	Mean depth.	Area.	Mean velocity per second.	Dis-charge.	Authority.
	Feet.	Feet.	Feet.	Square feet.	Feet.	Cubic feet.	
1879.							
May 9	11.7	1,040	9.89	16,575	3.85	63,754	Report of Mississippi River Commission Appendix XX of Annual Report of Chief of Engineers, 1894.
May 12	10.6	1,045	8.96	14,085	3.32	46,707	Do.
May 2	10.4	990	9.93	13,965	3.46	48,358	Do.
May 3	10.3	998	9.77	13,780	3.43	47,265	Do.
May 1	10.0	990	9.61	13,125	3.45	45,268	Do.
May 7	9.7	1,030	9.71	13,815	3.42	47,262	Do.
May 5	9.4	1,070	9.36	12,595	3.20	40,296	Do.
May 6	8.8	1,080	9.29	12,770	3.11	39,756	Do.
May 15	6.7	1,020	9.56	10,130	2.54	25,738	Do.
Feb. 20	6.6	980	7.75	7,693	3.50	26,949	Do.
Feb. 21	6.5	975	8.01	7,670	3.15	24,167	Do.
Feb. 22	6.1	975	8.53	7,920	2.92	23,101	Do.
Apr. 30	5.5	995	9.33	8,360	2.72	22,797	Do.
Feb. 24	5.5	975	8.24	7,861	2.50	19,645	Do.
May 17	5.4	1,030	9.60	8,860	2.25	19,950	Do.
Feb. 25	5.2	975	9.22	7,555	2.37	17,893	Dq.
Feb. 26	5.0	975	9.25	7,430	2.42	17,979	Do.
Mar. 20	5.0	1,005	9.37	7,395	2.28	16,841	Do.
Feb. 27	4.9	975	9.35	7,335	2.35	17,261	Do.
Feb. 28	4.9	975	9.34	7,120	2.28	16,282	Do.
Mar. 1	4.9	975	9.37	7,217	2.28	16,450	Do.
Mar. 3	4.9	975	9.57	7,310	2.24	16,392	Do.
Mar. 4	4.8	990	9.43	7,235	2.25	16,245	Do.

Mar. 15	4.8	1,000	9.34	6,970	2.16	15,020	Do.
Mar. 21	4.7	990	9.60	7,350	2.25	16,578	Do.
Apr. 12	4.7	1,000	9.29	7,080	2.18	15,435	Do.
Mar. 17	4.6	1,005	9.26	7,070	2.22	15,676	Do.
Mar. 19	4.5	1,005	9.44	7,140	2.29	16,333	Do.
Apr. 11	4.5	1,000	9.31	6,900	2.17	14,951	Do.
Mar. 26	4.5	1,000	9.16	6,980	2.24	15,674	Do.
Mar. 5	4.5	1,005	9.19	6,955	2.12	14,772	Do.
Mar. 18	4.4	1,005	9.50	7,140	2.18	15,545	Do.
Mar. 22	4.4	1,000	9.44	7,090	2.16	15,291	Do.
June 7	4.4	1,040	8.75	6,700	1.92	12,875	Report of Mississippi River Commission, Appendix XX of An- nual Report of Chief of Engineers, 1894.
Mar. 25	4.3	1,002	9.37	6,990	2.19	15,318	Do.
Mar. 14	4.3	1,005	9.65	7,010	2.16	15,136	Do.
Mar. 6	4.3	1,008	9.67	6,600	2.19	14,470	Do.
Mar. 24	4.2	1,008	9.34	6,790	2.19	14,880	Do.
Apr. 10	4.2	1,000	9.17	6,330	2.34	14,823	Do.
May 20	4.1	1,062	9.51	7,105	1.99	14,116	Do.
June 9	4.1	1,040	9.57	6,900	2.01	13,886	Do.
Mar. 7	4.1	998	9.24	6,490	2.08	13,500	Do.
Mar. 27	4.0	1,000	9.40	6,850	2.18	14,910	Do.
Mar. 13	4.0	1,015	9.19	6,260	2.09	13,079	Do.
Mar. 8	3.9	1,002	9.29	6,355	2.14	13,578	Do.
Apr. 14	3.8	1,010	9.39	6,685	2.12	14,199	Do.
Mar. 28	3.8	1,000	9.42	6,440	2.06	13,260	Do.
Mar. 10	3.7	1,010	9.35	6,190	2.04	12,649	Do.
Mar. 29	3.6	1,010	9.28	6,154	2.00	12,292	Do.
Mar. 12	3.6	1,000	9.35	5,940	1.91	11,362	Do.
Mar. 11	3.6	1,000	9.26	6,030	1.88	11,349	Do.
Apr. 5	3.6	1,010	9.28	6,165	2.00	12,323	Do.
Apr. 4	3.5	1,010	9.37	5,966	1.92	11,502	Do.
Apr. 15	3.3	1,010	9.55	6,250	1.91	11,944	Do.
May 23	3.3	1,060	9.62	6,500	1.81	11,771	Do.
Apr. 19	3.3	1,008	9.45	5,825	1.98	11,548	Do.
June 10	3.2	1,040	5.95	6,150	1.86	11,435	Do.
Apr. 9	3.2	1,010	9.47	5,705	1.86	10,589	Do.
Apr. 7	3.1	1,010	9.31	5,820	1.96	11,422	Do.
May 24	3.1	1,050	9.71	6,375	1.77	11,271	Do.
Apr. 18	3.1	1,000	9.51	5,660	1.87	10,564	Do.
Apr. 8	3.1	1,000	9.42	5,590	1.81	10,118	Do.
Apr. 29	3.0	1,010	9.45	5,855	2.01	11,756	Do.
Apr. 3	3.0	1,010	9.54	5,785	1.79	10,348	Do.
Apr. 16	3.0	1,008	9.44	5,840	1.91	11,144	Do.
Mar. 31	3.0	1,010	9.31	5,740	1.79	10,284	Do.
Apr. 1	2.9	1,015	9.34	5,685	1.78	10,141	Do.
Apr. 2	2.8	1,015	9.26	5,450	1.85	10,036	Do.
Apr. 17	2.8	1,010	9.55	5,780	1.81	10,446	Do.
Apr. 21	2.8	1,008	9.42	5,390	1.75	9,431	Do.
May 26	2.7	1,050	9.70	5,860	1.75	10,227	Do.

June 11	2.6	1,040	9.33	5,460	1.74	9,488	Do.
Apr. 28	2.5	1,010	9.36	5,395	1.77	9,524	Do.
May 27	2.5	1,040	9.68	5,565	1.64	9,103	Do.
Apr. 22	2.5	1,005	9.54	5,270	1.73	9,130	Do.
Apr. 23	2.5	1,008	9.50	5,185	1.58	8,212	Do.
Apr. 27	2.4	1,008	9.56	5,255	1.76	9,240	Do.
May 28	2.3	1,040	9.58	5,295	1.62	8,555	Do.
Apr. 24	2.3	1,010	9.55	5,080	1.72	8,760	Do.
July 2	2.3	1,040	9.49	4,835	1.56	7,561	Do.
Apr. 26	2.2	1,008	9.56	5,255	1.76	9,240	Do.
July 3	2.2	1,040	9.70	5,010	1.51	7,551	Do.
June 6	2.2	1,040	9.52	4,800	1.50	7,222	Do.
July 4	2.1	1,040	9.49	4,740	1.55	7,347	Do.
May 29	2.0	1,040	9.87	5,350	1.56	8,338	Do.
July 5	2.0	1,040	9.70	4,900	1.53	7,513	Do.
June 12	2.0	1,040	9.45	5,100	1.60	8,140	Do.
July 1	2.0	1,040	9.02	4,290	1.48	6,363	Do.
May 30	1.9	1,040	9.72	4,985	1.52	7,595	Do.
June 13	1.8	1,040	9.42	4,714	1.48	6,981	Do.
May 31	1.7	1,040	9.57	4,870	1.46	7,133	Do.
June 2	1.6	1,040	9.80	4,940	1.43	7,059	Do.
June 3	1.6	1,040	9.64	4,630	1.40	6,467	Do.
June 4	1.6	1,040	9.71	4,680	1.40	6,550	Do.
June 5	1.6	1,040	9.21	4,445	1.47	6,528	Do.
June 30	1.6	1,040	9.18	4,010	1.20	4,819	Do.
June 14	1.5	1,040	9.36	4,350	1.42	6,191	Do.
June 16	1.4	1,040	9.39	4,290	1.29	5,522	Do.
June 17	1.2	1,040	9.34	4,125	1.15	4,746	Do.
June 18	1.1	1,040	9.27	3,970	1.13	4,477	Do.
June 19	1.0	1,040	9.19	3,780	1.05	3,974	Do.
June 20	1.0	1,040	9.10	3,590	1.11	3,971	Do.
June 26	1.0	1,040	9.17	3,555	1.16	4,115	Do.
June 27	1.0	1,040	9.25	3,695	1.22	4,500	Do.
June 28	1.0	1,040	9.21	3,670	1.21	4,432	Do.
June 21	.7	1,040	9.19	3,495	1.11	3,882	Do.
June 23	.7	1,040	9.27	3,510	1.15	4,038	Do.
June 24	.7	1,040	9.21	3,510	1.15	4,035	Do.
June 25	.7	1,040	9.24	3,560	1.07	3,822	Do.

(Number of days in each year from January 1, 1879, to January 1, 1900 (21 years), during which the stages were at stated heights above a low-water plane indicated by a discharge of 1,000 cubic feet per second.)

Minimum stages of 0 on October 23-24, 1879, November 20, 1887, and October 27-31, 1897.

Year.	Frozen and missing.	Heights, 0 to 0.5; discharge, 1,000 to 1,850 cubic feet.	Heights, 0.6 to 1; discharge, 2,000 to 2,750 cubic feet.	Heights, 1.1 to 2; discharge, 2,950 to 4,875 cubic feet.	Heights, 2.1 to 3; discharge, 5,100 to 7,400 cubic feet.	Heights, 3.1 to 4; discharge, 7,650 to 10,300 cubic feet.	Heights, 4.1 to 5; discharge, 10,600 to 13,625 cubic feet.	Heights, 5.1 to 6; discharge, 14,000 to 17,525 cubic feet.	Heights, 6.1 to 10; discharge, 17,950 to 39,350 cubic feet.	Heights, 10.1 to 15; discharge, 40,000 to 79,800 cubic feet.	Heights, 15.1 to 20; discharge, 80,300 to 144,000 cubic feet.	Heights, 20.1 to 25; discharge, 145,400 to 320,000 cubic feet.	Heights, 25.1 to 29; discharge, 328,000 to
		Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.	Days.
1879.....		52	11	38	81	42	30	47	37	23	4		
1880.....		1	46	78	47	49	26	27	61	28	3		
1881.....		10	37	37	15	14	47	39	84	72	10		
1882.....				13	39	27	41	42	105	54	33	10	1
1883.....						25	30	39	174	52	27	18	
1884.....						13	60	36	144	75	19	13	6
1885.....					19	53	19	15	76	97	57	22	7
1886.....				50	45	54	42	37	92	42	3		
1887.....	10	12	31	87	58	34	40	25	55	11	2		
1888.....	4			51	41	42	41	37	96	36	18		
1889.....				9	22	17	28	42	150	68	23	6	
1890.....					16	20	13	34	99	118	49	16	
1891.....				9	44	30	34	19	101	95	31	2	
1892.....						1	20	48	170	60	35	19	13
1893.....				11	50	41	27	35	105	64	17	15	
1894.....			9	56	84	35	20	17	72	41	25	6	
1895.....				94	80	39	31	18	52	27	15	9	
1896.....				31	72	33	33	20	127	40	9	1	
1897.....		77	23	14	39	30	16	22	89	37	16	2	
1898.....				7	31	49	33	30	120	55	21	14	5
1899.....			11	60	44	38	41	29	72	52	10	8	
Total..	14	152	168	645	827	686	672	658	2,081	1,147	427	161	32

Arkansas River at Little Rock.

Average number of days in each month from January 1, 1879, to January 1, 1900 (twenty-one years), during which the stages were at stated heights above a low-water plane, indicated by a discharge of 1,000 cubic feet per second.

(Maximum stage 29.03, May 21, 1892; minimum stage 0, October 23-24, 1879, November 20, 1887, October 27-31, 1897.)

Height above low-water plane.	Discharge in cubic feet per second.	Average number of days in—												Total days per year.
		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
0 to 0.5.	1,000 to 1,850	0.4					0.1			0.4	2.7	3.0	0.7	7.3
0.6 to 1.0.	2,000 to 2,750	0.4							0.9	2.2	2.2	2.0	0.3	8.0
1.1 to 2.0.	2,950 to 4,875	2.4	0.5	0.3	0.9	0.9	0.9	0.9	2.9	5.3	7.4	5.3	3.0	30.7
2.1 to 3.0.	5,100 to 7,400	2.9	2.1	0.3	1.1	1.4	1.1	2.8	6.5	5.8	4.7	3.9	6.7	39.3
3.1 to 4.0.	7,650 to 10,300	2.4	1.8	1.1	1.5	0.8	2.1	4.0	4.4	3.4	2.8	3.3	5.2	32.8
4.1 to 5.0.	10,600 to 13,625	2.4	2.1	1.7	2.0	1.9	2.4	4.1	2.9	3.8	3.6	2.5	2.6	32.0
5.1 to 6.0.	14,000 to 17,525	3.6	2.3	2.0	2.5	2.6	2.3	4.0	3.2	2.1	1.3	2.4	3.0	31.3
6.1 to 10.0.	17,950 to 39,350	8.7	8.9	12.3	11.7	7.1	10.3	10.3	7.9	5.0	4.6	6.0	6.2	99.0
10.1 to 15.0.	40,000 to 79,800	5.6	6.2	8.1	6.6	9.1	7.3	3.7	1.7	1.8	1.7	1.3	1.5	54.6
15.1 to 20.0.	80,300 to 144,000	1.2	0.9	1.2	0.9	0.9	0.9	1.2	0.9	0.9	0.9	0.9	1.3	20.4

Discharge Curve.

Mean for Rising and Falling River.

In connection with the 51 discharge measurements made between the years 1885 to 1889 at Little Rock, as tabulated in the United States Engineer Office at Little Rock, the following remarks may be made:

The two measurements made in 1885 and 1886 by the Little Rock Engineer Office do no appear to be commensurable with other measurements.

The 32 measurements made in 1887 and 1888 by Mr. John C. Branner, former State geologist of Arkansas, cover stages varying from 1.6 to 17.9 feet, on what appears to have been a special gauge, or from 2.65 to 19.3 feet on the United States Engineer gauge, as recorded on even dates.

These discharges scarcely afford by themselves sufficient data on which to base a discharge curve, but conform very well with a curve obtained from other data.

The two measurements made in May, 1892, by Mississippi River Commission, which depend upon areas obtained in the preceding January, are obviously in error and are disregarded.

The four measurements made in 1898 by Mississippi River Commission depend upon soundings made by an inexperienced leadsman using a lead of only 10 pounds weight in a mean current of 10.5 feet per second. It is considered that the results of these measurements as tabulated are too large, and in making use of them in the mean discharge curve they have been reduced 15 per cent in amount. This amount of reduction is justified by previous experience under like conditions, and, while arbitrary, is undoubtedly in the right direction. The exact value of these discharges, however, is not material in considering low-water channels.

In 1879 a series of careful gaugings were made at Pine Bluff, Ark., 66 miles below Little Rock, under the direction of Maj. (now Col.) Charles R. Suter, Corps of Engineers. Between February 20 and July 5, 108 observations for discharge were made, covering a period during which the recorded stages on the Little Rock United States engineer gauge varied from 0.7 foot to 11.7 feet, with corresponding discharges of about 4,000 to 60,000 cubic feet per second. (See Report of Chief of Engineers, 1894, p. 2852.)

A straight line-gauge relation results from plating the readings of the local Pine Bluff gauge with those of the day previous at the Little Rock United States engineer gauge, and one day was accordingly adopted as the time interval between the two gauges.

Platting the 1879 Pine Bluff discharges to the Little Rock stages of one day earlier, a well-defined discharge curve is obtained, and continuing this curve downward to the lowest stage of that year (1 foot), the corresponding discharge is about 1,000 cubic feet per second. (See Curve A, Plate A.)

The "Branner" observations of 1887 and 1888 were made at stated gauge heights on what appears to have been a special gauge, and are sufficient in number to plat a relation between it and the United States engineer gauge at Baring Cross Bridge.

The "Branner" discharges platted to the transferred gauge heights form a series into which the curve obtained from the Pine Bluff discharges is applicable with a marked degree of probability, but with its zero raised to the level of the extreme low water of 1887, or 0.22 foot above the zero of 1879. (See Curve B, Plate A.)

The Little Rock engineer office observations of 1897 and 1899 platted to the related stages of the United States engineer gauge form a limited series into which the same
413 discharge curve is applicable, but with its zero raised to the level of extreme low-water of 1897, or 0.75 foot above the zero corresponding to the 1,000 cubic feet discharge of the 1879 curve.

Three separate observations in 1897 give an average discharge of 1,181 cubic feet, at a stage of about 0.1 foot above the lowest of that year, so that an extreme low-water discharge of about 1,000 cubic feet appears probable.

Plate B is an exhibit of the relative highest and lowest stages at the Little Rock United States engineer gauge for each year from 1879 to 1899, inclusive. It will be noticed that the discharge data at hand corresponds with the three extreme low-water years.

A line joining the stages at dates when the three discharge curves indicate a discharge of 1,000 cubic feet per second, the stages being recorded stages, but reduced to the locality of the United States engineer gauge on the Baring Cross Bridge and expressed in elevations above Cairo datum—viz, 243.28 feet October 23, 1879; 243.50 feet November 20, 1887, and

244.03 feet October 26, 1897—would represent the apparent rise of the low-water plane during that period. This line is drawn on Plate B and from it the tables have been prepared, one showing the average number of days in each month from January, 1879, to January, 1900 (twenty-one years), during which the stages at Little Rock were at stated heights above a low-water plane indicated by a discharge of about 1,000 cubic feet per second, and the other showing number of days in each year when the river was at stated heights above same plane.

On Plate C are platted all the discharge measurements reduced to correspond with the line of apparent rise of the low-water plane, with the discharge curve extended to embrace the modified flood measurements of the Mississippi River Commission in 1898.

¹First Section, Arkansas River from its source to mouth of Grand River.—The lowest gauging station maintained on the Arkansas River by the Geological Survey is at Hutchinson, Kans., about 50 miles above Wichita. At this point in August and October of 1897 there was no flow, the smallest monthly average being 35 feet per second, in November. The maximum discharge was reported in February, 2,270 feet per second, the average for that month being 506 feet per second. The gauge at this place had an extreme range during 1896 and 1897 of 2.85 feet. The report of Burrow's survey gives the discharge of the river 102 miles below Wichita as 1,440 cubic feet per second, the stage of water being about 2 feet.

The following discharge observations on this part of the river were taken under the direction of the Board during the season of 1899, while the stage of water was about ordinary low-water in this portion of the river:

Location	Distance above Grand River.	Cubic feet per second.	
	Miles.		
Arkansas City, Kans.....	246.6	173	Cimarron enters here.
Tulsa, Ind. T.....	65.0	350	Verdigris enters here.
Above mouth Grand River.....	0.0	411	

Discharge of Grand River at mouth, 592 cubic feet.

The discharge at Little Rock, measured a few days later, was 2,300 cubic feet, which was double the lowest measured discharge at that point, viz, 1,160 cubic feet, and
 414 2.3 times the assumed minimum of 1,000 cubic feet.

Reducing the discharge above mouth of Grand in the same proportion—that is, by dividing by 2.3—we would have about 179 cubic feet for the extreme low-water discharge.

The extreme low-water discharge on this section of the river is assumed, then, as varying from nothing above Wichita to not over 200 cubic feet per second above the mouth of Grand River. The report of the Board of Engineers in 1888 estimated the discharge of this section as varying from 500 cubic feet at Wichita to 1,500 cubic feet at the Canadian. The lower figure was based on an assumed low-water discharge of 2,000 cubic feet at Little Rock and on the assumption that the discharge of the river was uniform below the Canadian. It will be seen in the discussion of the next section of the river that neither of these assumptions is correct.

For 37 miles below Wichita the river slopes vary from 4.3 feet per mile to 3.5 feet per mile. The slope is gradually reduced until for the 82 miles between the Cimarron and the Grand the slope is 2 feet per mile. (See Plate D.) The average slope from Wichita to the Grand is 2.55 feet per mile. Below Wichita the general width between banks is about 700 feet, being as great as 1,200 feet in some places.

In view of the above facts, any project for obtaining continuous navigation on this part of the river, if possible, would entail great expense and be of doubtful value. Such project, if formed, would be useless until the lower portion of the river is improved, but the Board is of the opinion that the question of the feasibility and value to commerce of such improvements may well be left to future consideration.

As before stated, the mouth of the Grand River has always been considered the head of navigation on the Arkansas River. Attempts at navigation on the river above that point have been of rare occurrence and soon abandoned. The river between Wichita and the Grand is crossed by 19 fixed bridges and by 2 fixed dams.

Second section, Grand River to Little Rock, 287 miles.—After leaving the mouth of Grand River the only tributary of any importance is the Canadian, 37 Miles below; but the low-water discharge of the river gradually increases to the mouth,

from small tributaries and infiltration. In October, 1899, the low-water discharge of the river between Little Rock and Penderton increased from 2,300 cubic feet per second to 2,820 cubic feet, an increase of over 20 per cent in 132 miles, with not a single running stream entering the river in that distance.

The following low-water measurements have been made on the second section:

Location.	Distance above mouth.	Date.	Nearest gauge.	Cubic feet per second.
	Miles.			
Below mouth of Grand River ¹	460.8	Oct., 1899	0.7	1,003
Fort Smith.....	367.7	....do....	1.7	² 1,565
Do.....	367.7	....do....	1.7	² 1,514
Dardanelle.....	261.4	....do....	1.0	² 1,876
Do.....	261.4	....do....	1.1	² 2,225
Little Rock.....	173.4	....do....	2.3	2,300
Do.....	173.4	Oct., 1897	1.8	1,522
Do.....	173.4	....do....	1.4	1,195
Do.....	173.4	....do....	1.4	1,160
Do.....	173.4	....do....	1.3	1,190
Do.....	173.4	Nov., 1894	2.4	2,597

¹The discharge below mouth of Grand River was obtained by adding the discharge above mouth, 411 feet, and the discharge of the Grand, 592 feet.

²Average, 1,539.5.

²Average, 2,052.

415 The measurements in October 1899 were made within eight days with river about stationary.

The year 1899, it will be seen from the gauge observations at Little Rock, has not been one of extreme low water, and owing to the lack of observations at the upper stations the extreme low-water discharge on the upper part of this section can only be approximated from the Little Rock gaugings.

The average low-water slope on this part of the river is 0.91 feet per mile.

The extreme low-water flow just below the mouth of Grand River may pretty positively be stated to be not more than, and probably a little less than, 500 cubic feet per second. The discharge measured October 23, 1899, was 1,003 cubic feet per second. The two discharges measured at Fort Smith October 25, 1899, averaged 1,539.5 cubic feet per second. The average of two discharges measured October 27 and 28, 1899, at Dardanelle, was 2,052 cubic feet per second. The measurement at

Little Rock October 31, 1899, was 2,300 cubic feet per second. The smallest measured low-water discharge at Little Rock, which was made October 3, 1897, was 1,160 cubic feet per second, almost exactly one-half of the discharge of October 31, 1899, the gauge reading being 1.4 October 3, 1897, and 2.3 October 31, 1899.

It is believed that as the stage in 1897 was slightly lower after the smallest discharge—1,160 cubic feet was measured—1,000 cubic feet per second may be taken as the extreme low-water flow at Little Rock without material error. Applying the reduction from the October, 1899, measurement to the extreme low-water discharge at Little Rock, viz, from 2,300 to 1,000 feet to the October, 1899, measurements at mouth of Grand, Fort Smith, and Dardanelle, by dividing by 2.3 the extreme low-water discharges may be taken as follows: At mouth of Grand, 436 feet; Fort Smith, 670 feet; Dardanelle, 892 cubic feet.

This exceeding smallness of volume of low-water flow in a river bed that carries in flood the large volume of nearly 600,000 cubic feet per second at once suggests the difficulty and great cost of making channels for navigation of a character and capacity that would be worth the making.

One result of this variation in volume of flow, very important in the consideration of channel improvement, is a noncoincidence of the high and low water channels. The enormous high-water flow, requiring a much larger radius of curvature in bends, tends to cord the sharper bends made by the low-water channel, causing the two channels to cross, filling up the low-water channel during flood and causing high middle bars through which the low-water river makes its way, often in two or more channels and without any permanence. Any improvement, therefore, must contemplate regulation of both high and low water flow.

The width of the river between banks varies greatly, owing to the nature of the soil and the violence of the floods. The average width is between 1,700 and 1,900 feet. Where it touches the bluffs the width falls as low as 600 feet. In other portions it is as great as 3,000 feet.

To contract a river with an average high-water width of 1,800 feet to a low-water channel of, say, 300 feet will require extensive works.

Open river channels, it is believed, can be made. They would necessarily be small, and in the upper part of the reach

very shallow during low-water seasons, and of doubtful utility at such times.

416 From the deduced tables of duration of stages given heretofore it will be found that a volume of discharge of about 2,700 feet per second at Little Rock might be assumed as the smallest discharge for ordinary low water, as there were only three hundred and twenty days in twenty-one years when the flow was not greater.

With a discharge of 2,700 cubic feet at Little Rock, the discharge at Dardanelle would probably be about 2,400 feet; at Fort Smith about 1,800 feet, and at the mouth of the Grand about 1,175 feet. These are, of course, approximations, but believed to be pretty close, and are found by percentage above the October, 1899, measurements, which were 2,300 feet at Little Rock 2,052 feet at Dardanelle, 1,539.5 feet at Fort Smith, and 1,003 feet just below the mouth of the Grand. To make navigable channels in this part of the river one of two systems must be adopted. One is by confining the low-water flow to channels sufficiently narrowed to give the requisite depth, and the other is to raise the water surface to give requisite depths by means of dams with locks for the passage of boats. One is open-river navigation, the other is slack-water navigation, and they will be discussed separately.

Open-River Navigation.

For open-river navigation the volume of flow that may be depended upon is a vital consideration. In this reach of river it is believed the ordinary low-water flow is not less than 2,700 feet at Little Rock, diminishing to about 1,175 feet at the mouth of the Grand, with an extreme variation in very low-water years, which occur at considerable intervals, to only about 1,000 feet at Little Rock and 436 at the mouth of the Grand.

By an examination of the discharge table it is found that on November 23, 1894, a channel was measured at Little Rock, which showed a width of 320 feet, a mean depth of 5.2 feet, mean velocity of 1.56 feet per second, and discharge of 2,597 feet per second. From this measurement it might be assumed that a channel in the same place 300 feet in width, with a discharge of 2,700 feet per second, would give a slightly increased velocity or mean depth. Assuming a mean depth of 5 feet, the velocity would be 1.8 feet per second.

From further examination of the table we find that on October 20, 1879, a channel was measured having a width of 315 feet, mean depth of 4 feet, mean velocity of 0.91 foot, and discharge of 1,160 cubic feet per second. From this measurement it might be assumed that a channel in the same place 300 feet in width, with a discharge of 1,000 feet per second, would have a decreased velocity or depth. Assuming a velocity of 0.9 foot per second, the mean depth would be 3.7 feet.

Unfortunately there are no comparative channel measurements just below the mouth of the Grand, last season's measurements being taken above the mouth and in the Grand. The slope in that part of the river is considerably steeper than at Little Rock, but the low-water depths and discharges are considerably less, the steeper slope tending to increase the velocity and the lesser depths and volumes of discharge tending to decrease the velocity.

If we may assume that the low-water velocities are about the same as at Little Rock—that is, for the assumed ordinary low water 1.8 feet per second, and for the extreme low water 0.9 foot per second—these velocities would give for a channel just below the mouth of the Grand when the volume of
417 flow was 1,175 feet, width 300 feet, velocity 1.8 feet per second, mean depth 2.18 feet; when the volume of flow was 436 feet, width 300 feet, velocity 0.9 foot per second, mean depth 1.6 feet, central depth about 2.15 feet. That these last dimensions are not far from correct may be shown by comparison with a channel measured October 22, 1899, at Tulsa, about 68 miles above—width 297 feet, velocity 0.83 foot, mean depth 1.5 feet, discharge 350 feet. To increase this discharge to 436 feet without increasing velocity would require about 0.3 foot increase of depth, which would then give mean depth 1.8 feet mean velocity 0.83 foot; but this increase of volume would slightly increase the velocity, and consequently not increase the depth so much as 0.3 foot, so that it would appear that a mean depth of 1.6 feet and mean velocity of 0.9 foot per second is a close approximation for an extreme low-water channel 300 feet in width in this part of the river.

The above-mentioned cross sections of the river were actual low-water sections, but they may not have been fair average sections with regard to slope and velocity. We will therefore compare them with theoretical sections as computed by formula.

The average slope of low water from Fort Smith to Little Rock by the new channel laid down on the maps is 0.78 foot

per mile, and the course of the channel is a succession of bonds of considerable curvature. A considerable part of the slope would be consumed by the resistance to flow caused by the bends.

First assuming a straight channel with a slope of 0.78 foot per mile and computing by formula $q=ac\sqrt{rs}$ in which q is volume of flow, a area of cross section, c constant, taken at 78 for a depth of 4.5 feet and 80 for a depth of 5 feet, r is hydraulic mean radius assumed (as very nearly correct) to be equal to mean depth, and s sine of angle of slope, the mean depth for a channel of 300 feet surface width would be 4.5 feet. Assuming that 0.23 foot per mile is consumed by the bend resistance, and applying the remaining slope of 0.55 foot per mile, the mean depth would be 5 feet.

Applying the same method of computation to the localities of Dardanelle and Fort Smith, it might be stated that by suitable works channels 300 feet in surface width might be made as follows:

In ordinary low water.

	Mean depth.	Miles from mouth of river.
	Feet.	
At Little Rock.....	4.5 to 5	173.4
At Dardanelle.....	4 to 4.5	261.4
At Fort Smith.....	3 to 3.5	367.7
At mouth of Grand River.....	2 to 2.25	460.8

For a large part of the year all of the depths would be greater and channels wider, and for short periods at long intervals they would be less.

In making channels for navigation in a river whose banks are yielding the first consideration in a permanent improvement is to fix the river in its bed, so that works for channel

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418 rectification shall not lose their proper effect or be subjected to destruction by changes of attack from the forces of the flowing water that would arise from change of position of the waterway.

Rivers like the Arkansas, flowing through alluvial valleys, flow in a succession of bends with occasional straight reaches.

In the bends where the curvature is sufficient the deep water follows the concave bank, constantly eroding it if it is not sufficiently hard to resist. In the straight reaches the water spreads, giving shallow depths, with inconstant position, and erosion may occur in both banks when the velocity is as great as in the Arkansas River, where flood velocities of 10 to 12 feet per second are found. Fixing of the bed of the river, therefore, involves the protection of one bank or the other for the entire distance, with possible exception of short lengths in crossings and those parts that are unyielding. With the river bed fixed in position, the forming of navigable channels requires the directing of the flow into such limited parts of the bed that the low-water cross section of flow shall have sufficient width and depth for navigable purposes and the line of flow shall be an easy one for vessels to follow.

In making such navigable low-water channels due attention must be given to the requirements of flood flow. There are two methods of forcing the low water into channels of proper width—one by contracting the widths to a proper degree by cross and longitudinal dikes, the other by compelling the water to flow in a succession of curves of such radius that the centrifugal force developed by the curvature will, in low water, keep the water against the bank and yet not be of such small radius as to impede the high-water flow or cause it to chord the bend. The second method, where it can be employed, requires comparatively few dikes except at crossings, where they may be necessary to direct and confine the flow from one curve to another when the relative positions of the two curves are not such that the crossing will be made without directing works. The latter method is much the cheaper on account of requiring a smaller number of dikes, reducing the amount of bank protection necessary, and having the great advantage of not limiting the width of channels at medium stages to the low-water width. The Arkansas River lends itself to the second method in a remarkable degree. It flows in a succession of curves, many of them of proper degree of curvature to hold deep water against the concave banks, and many of the crossings would require no directing works after the banks in the bends had been fixed.

Plans are presented herewith for improvement of this section of the river for open-river navigation, with estimates by reaches, viz: From Little Rock to Dardanelle, 88 miles; from Dardanelle to Fort Smith, 107 miles; from Fort Smith to the mouth of the Grand, 93 miles. These plans are based upon the published maps of surveys, which are believed to be suf-

ficiently accurate at the present time for the purpose of outlining the plans and estimating cost. Of course, new surveys would be required for definite location of works.

The estimates of cost are as follows:

Little Rock to Dardenelle, 88 miles:

269,100 feet of revetment for bank protection, at \$10	\$2,691,000
41,000 feet of low dikes, at \$10	410,000
66,450 feet of high dikes, at \$20	1,329,000
31,800 feet of abatis, at \$2.50	79,500
Total, construction of works	<u>4,509,500</u>

419 Dardanelle to Fort Smith, 106.3 miles:

346,650 feet of revetment for bank protection, at \$10	\$3,466,500
65,250 feet of low dikes, at \$10	652,500
69,880 feet of high dikes, at \$20	1,397,600
34,450 feet of abatis, at \$2.50	86,125
Total, construction of works	<u>5,602,725</u>

Fort Smith to mouth of Grand River, 93.1 miles:

305,800 feet of revetment for bank protection, at \$10	3,058,000
66,200 feet of low dikes, at \$10	662,000
69,000 feet of high dikes, at \$20	1,380,000
23,950 feet of abatis, at \$2.50	59,875
Total, construction of works	<u>5,159,875</u>

Slack-Water Navigation.

In this method of river improvement a sufficient volume of flow is required to supply the amount of water needed for lockages, for leakage at dams, and for evaporation. Two systems may be used. One, with fixed dams, makes it necessary for boats to pass through locks until the river rises to a very high stage, when the dams may be drowned and boats pass over them. The other with movable dams, which may be thrown down at medium stages, thus giving at such times the advantage of open-river navigation without detention at locks.

If slack-water navigation should be adopted for the Arkansas River, it is considered that the dams should be movable

rather than fixed, for there are considerable portions of the year when there is sufficient water for open-river navigation. Moreover, the flood discharges of the river are so great that as little obstruction as possible should be interposed to flood flow. It is believed that there would be no special difficulty in building locks and movable dams on this part of the river, but the river would have to be fixed in a permanent bed to prevent its passing round the dams. This would require the protection of one bank or the other except where the river flows along rock bluffs for the whole length of the reach where dams were placed.

There are many points where the river flows along rocky bluffs and where solid rock is to be found in the bed of the stream at no great depth, and there is part of the bed that is composed of gravel, which form sufficiently solid foundation for the dams. It is probable that at some of the sites special care would be required in preparing foundations, with consequent increase of cost.

The Board believes that the plans of the locks and dams on the Great Kanawha River in almost all of their details might be advantageously adopted. The locks of last construction have chambers 342 feet in length and 55 feet in width, sufficient for the lockage of a steamboat and three coal barges 130 feet long and 25 feet wide, which is about standard size. The navigable passes are generally 248 feet in width. The Chan-nine wickets in the passes are 13 feet in vertical height above the sills, generally admitting a lift of about 8 feet between pools and providing for 6 feet of depth for navigation.

The locations of locks and dams on the Arkansas River would require careful surveys and consideration of local conditions in the vicinity of sites that might be deemed advantageous.

420 The fall of low-water surface in the 287 miles from the mouth of the Grand to Little Rock is about 260 feet.

There would therefore be required about 33 locks and dams with average lift of about 8 feet.

In making an estimate of the cost of locks and dams the board believes there is no safer method than to take the actual units of cost of the Kanawha River works, adding thereto a reasonable amount to allow for more difficult foundations.

The Kanawha River locks and dams are founded on rock or hardpan, and the river flows in a narrow valley, the sides of which are rock-bound, the river banks being of hard material.

The Arkansas has at numerous points one rocky, bluff bank, but never both, and its bed and banks are generally of much softer material. The cost of making structures permanent would therefore be increased in most cases, and it is believed that the average increase of cost might be placed at about \$50,000 for each site.

The average of the costs of two locks and dams, Nos. 6 and 7, of the Kanawha River, the details of which were kindly furnished by courtesy of Capt. H. F. Hodges, Corps of Engineers, was—

For lock	\$192,557.00
For each foot of navigable pass	285.50
For each foot of weir	201.50
For pier and abutments	13,060.00

Adopting the Kanawha width of navigable pass, 248 feet, sites could be selected which would give an average width of weir of 600 feet. An estimate of average cost for each lock and dam, then, would be, in round numbers—

For lock, Kanawha cost	193,000
For navigable pass, 248 feet, at \$285.50, Kanawha cost	70,804
for weir, 600 feet, at \$201.50, Kanawha cost	120,900
For pier and abutment, Kanawha cost	13,060
For additional cost for foundations	52,236
Total	450,000

Thirty-three locks and dams, at \$450,000=\$14,850,000.

In the 287 miles of this section of river there are 63 miles of contact with rocky bluffs, leaving 224 miles of river where both banks are composed of soft material. The bank on one side or the other of this stretch would require protection, which, if of revetment, would cost \$10 per linear foot—224 miles=1,182,720 feet, at \$10 per foot, would cost \$11,827,200.

The total cost then, would be, for locks, dams, and bank protection, \$26,677,200.

Third section, Little Rock to mouth of river, 173 miles.—In this section there are fortunately, records of comparable discharge measurements made at very low stages in October, 1897 and 1899, at Little Rock, and October, 1897, and November, 1899, at Pendleton, the latter point being 42 miles above the mouth of the river. These measurements give 1,160 cubic feet per second at Little Rock and 1,781 cubic feet per second at Pendleton in 1897. The increase of volume of 621 cubic

feet between Little Rock and Pendleton during this very low stage which cannot be ascribed to tributary streams, as there were none flowing, is believed to be due to infiltration from cut-off lakes and pervious soil in lower part of the river in which water was held at higher stages of the river. This view is strengthened by observations recently made, October 31, 1899, when, with a stage 0.9 foot higher at Little Rock, the discharge was 2,300 feet, and November 4 at Pendleton 421 it was 2,820 cubic feet, an increase of 520 feet. The greater increase shown by the 1897 measurements is attributed to more rapid drainage, due to a lower river surface.

In this section of the river the volume of flow that may be depended upon is believed to be as follows, viz: In ordinary low water, 2,700 cubic feet at Little Rock, increasing to about 3,000 cubic feet at the junction of White River; thence to the mouth, increased by White River flow, estimated at 4,500 cubic feet (total, 7,500); in extreme low water, which would only occur at long intervals and for short periods, 1,000 feet at Little Rock and about 1,600 cubic feet above mouth of White.

On this part of the river, where there is but one point showing any indication of rock, the banks and bed are of extremely soft material, easily eroded. The construction and maintenance of locks and dams would be hazardous and very costly. The Board is of the opinion, therefore, that any improvement made should be for open-river navigation. Such improvement could be made, giving channels not less than 300 feet in width, with mean depth of about 5 feet, and central depth of about 7 feet in ordinary low water. For a large part of the year such channels would be wider and deeper. Plans are presented for the improvement of this section of the river, with estimates for reaches, viz: Mouth to Pine Bluff, 107 miles; Pine Bluff to Little Rock, 66 miles.

The estimates of cost are as follows:

Mouth of Pine Bluff, 107 miles:

501,850 feet of revetment, at \$10.....	\$5,018,500
61,800 feet of low dikes, at \$10	618,000
23,500 feet of high dikes, at \$20	470,000
13,000 feet of abattis, at \$2.50	32,500

Total	<u>6,139,000</u>
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Pine Bluff to Little Rock, 66 miles:

219,450 feet of revetment, at \$10	2,194,500
43,350 feet of low dikes, at \$10	433,500
50,550 feet of high dikes, at \$20	1,011,000
29,450 feet of abattis, at \$2.50	73,625

Total	<u>3,712,625</u>
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Grand total of cost for open river improvement:

Mouth to Pine Bluff	6,139,000
Pine Bluff to Little Rock	3,712,625
Little Rock to Dardanelle	4,509,500
Dardanelle to Fort Smith	5,602,725
Fort Smith to Grand River	5,159,875
Total	<u>25,123,725</u>

In addition to the complete formation and maintenance of channels there is another work that would be absolutely necessary for providing safety of navigation—that is the constant removal, at least for many years, of the snags formed by the enormous quantity of drift that passes down the river. For this purpose a properly equipped light-draft steel-hull snag boat should be provided at a cost of about \$75,000 and provision made for its operation and maintenance, which would require about \$25,000 per year.

There is appended to this report an exhibit of work heretofore done upon the Arkansas River, showing, in considerable detail, localities, nature of work, cost, and present condition. This work has necessarily been done piecemeal, scattered over 362 miles of river, with small appropriations, during about twenty years of time. But little of it is in good condition, much of it destroyed. Some of it perhaps, but not much, could be taken into consideration in any comprehensive plan of improvement.

Statement as to the Usefulness of the Improvement to Navigation and its Relation and Value to Commerce.

It may be stated in a few words that without channel improvements the navigation of the river will be utterly impossible for any considerable benefit to the tributary country. Some parts of the river are absolutely impassable in low water, and those parts that can be navigated by very small craft are so dangerous and present so much difficulty that there is but little benefit to be derived by such navigation and little inducement offered for attempting it.

With regard to the relation and value of the improvement of the river to commerce, it may be said that any piecemeal work such as has heretofore been provided for can have hardly any perceptible effect upon commerce; but improvement upon a plant sufficiently comprehensive to assure a safe and reliable means of transportation, adapted to the needs of the commerce demanding such transportation, might in time develop a commerce of large magnitude.

The country in the valley of the river contains much coal, which has as yet been hardly touched, and that alone, if we may judge by the experience in the Monongahela and Kanawha valleys, would upon the opening of a river route develop a very large industry and commerce.

Besides the coal the principal product of the valley is cotton. This is now transported by rail. How much of it would seek a river route if such route were available is problematical. Some of it undoubtedly would, and if such route were always available it is certain that railroad rates would be lowered to compete with it, and thus a river improvement would be beneficial even to those articles of commerce that did not use it.

The valley of the Arkansas River is not as yet thickly populated, and there are few cities or towns of any magnitude. The principal cities below the mouth of the Grand are Pine Bluff, Little Rock and Fort Smith.

An adequate improvement of the river would, as has been shown, cost a large amount of money. Whether the time is opportune and the needs of the country sufficiently urgent for the inauguration of such a work are matters for Congressional determination. From an engineering point of view the Board believes that the improvements of the river is feasible for open river navigation from its mouth to the mouth of Grand River, the channels decreasing in size from Little Rock upward, but of sufficient dimensions to admit of boats of considerable size, at least as far as Fort Smith, and that if channels of greater depth should be desirable above Little Rock, a depth of 6 feet could be obtained by the construction of locks and dams.

It is the opinion of the Board that any work of improvement should be done in reaches of continuous work, beginning the work in each reach at the head of the reach; and the Board desires to emphasize the statement that satisfactory

423 results and economy in cost can not be obtained except by continuous work, and the estimates are based upon such method and upon provision of funds by yearly appropriations of sufficient magnitude to keep a working plant in continuous operation.

Accompanying this report is a map¹ of the river from the mouth of the Grand to the Mississippi River, in 32 sheets, on a scale of 1,000 feet to the inch. Upon this map are laid out the works for improvement from which the estimates are made.

There are also 4 sheets of drawings showing details of construction of works proposed, Plates E, F, G, H.

Also 3 plates¹ relating to gauges and discharge, A, B, and C.

Exhibit of work heretofore done on the river.

Hydrographs¹ from 1872 to 1899.

Profile¹ of the river, Plate D.

Index of river, with statistics, Plate I.

Nine sheets showing works already constructed.

Respectfully submitted.

AMOS STICKNEY,
Lieutenant-Colonel of Engineers.

CHAS. L. POTTER,
Captain of Engineers.

ROBERT MCGREGOR,
Captain of Engineers.

Brig. Gen. John M. Wilson,
Chief of Engineers, U. S. A.

Exhibit of work done for permanent improvement of Arkansas River.

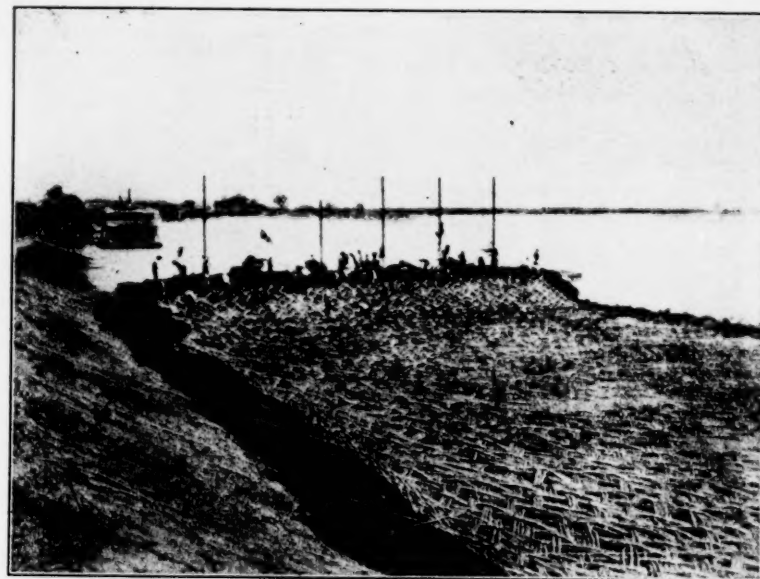
(See Plates I and 1-10, inclusive.)

Map No.	Locality.	Nature of work.	Be-gan.	Com-pleted.	Field.	Total.	Length.	Unit cost.	Condition August, 1899.	Purpose for which built.
1	Ainsworth...	Two dikes, brush and stone, built.	1892	1892	\$6,482.39	\$12,446.20	Feet. 800	15.557	\$750 repairs needed.	Hold head of bar and rectify channel.
		Dikes repaired.....	1895	1895	1,204.15	1,758.06				
1	Bruce Island	One dam, permeable two-row pile, built.	1890	1890	4,800.00	7,008.00	300	23.36		Close Cherokee chute and rectify channel at foot of Bruce Island.
		Dam repaired with stone and brush.	1897	1897	2,627.27	3,835.80				
2	Fort Smith...	Suter dike, brush and stone, built.	1878	1879		19,695.49	2,100	9.379	\$1,050 repairs needed	To remove bar from town front.
		Suter dike repaired....	1896	1897	6,349.58	9,270.39				
		Lewis dike, brush and stone, built, and two private dikes repaired.	1885	1885		5,000.00	240	20.833	No repairs needed.	Bank protection.
		High dike, permeable two-row pile, built.	1887	1887		12,662.49	1,300	9.740	Totally destroyed...	To rectify channel along Fort Smith front.
		Five dikes, permeable two-row pile, built.	1890	1891	27,800.00	38,971.68	2,000	19.435		Rectify channel through "The Narrows."
		Four dikes reconstructed with stone	1893	1893	12,000.00	19,560.00	1,600	12.224	No repairs needed.	Do.
		Three stone dikes built	1896	1897	8,419.34	12,292.23	700	17.56		To remove bar from bridge draw and town front.
3	Van Buren...	One dike, permeable two-row pile, built.	1889	1889		3,432.47	500	6.865	\$400 repairs needed.	Maintain channel through bridge draw and remove bar from town front.
		Dike reconstructed with stone and a railroad incline converted into stone dike.	1893	1894	8,528.00	13,013.60	1,500	8.676	do.....	Do.
4	Moore Rocks	One channel excavated	1891	1893	9,343.29	16,164.12	2,251	7.181	No repairs needed...	Channel improvement.
5	Dardanelle...	Two dikes, permeable two-row pile, built.	1887	1889		9,133.79	500	18.267		
		One dike reconstructed with stone.	1893	1894	8,863.98	12,852.81	200	64.426	\$2,500 repairs needed	Bank protection and remove bar from town front.
		One stone dike (200 feet) built and a wharf converted into a dike (140 feet).	1894	1894	8,880.59	12,876.81	390	33.017		
7	Fletcher Bend.....	Revetment; mattress 60 feet wide; riprap	1896	1898	24,248.47	35,402.76	8,520	4.155	Practically destroyed; \$8,000 re-	Bank protection.

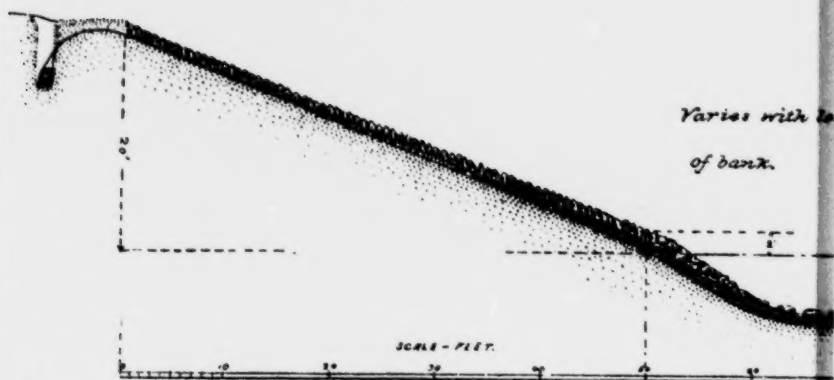
9	Pine Bluff....	Six dikes built, 400 feet brush and sand box; the rest two-row pile dike, permeable.	1885	1890	\$44,830.88	\$60,156.86	Feet. 2,470	24.363	1,770 feet of permeable dikes destroyed.	
		Four dikes repaired...	1887	1892	7,612.06	11,155.38				
		Two dikes, pile filled with brush and sand boxes.	1892	1892	8,592.25	16,411.19	300	54.740	\$5,000 repairs needed.	Bank protection
		Five dikes reconstructed with stone.	1892	1896	5,113.49	81,623.56	1,000	81.624		
		One stone dike repaired	1897	1898	5,548.80	8,102.25				
		Two revetments; one 2,115 feet long, mattress 175 feet wide, riprap to 15-foot stage; one 4,800 feet long, mattress 150 feet wide, riprap to 10-foot stage.	1892	1894	43,992.48	78,191.93	6,915	11.307		
		Revetments repaired...	1894	1898	6,843.03	9,983.45				
9	Fergus Reach	Four dikes, permeable two-row pile, built.	1890	1891	34,284.00	47,644.76	2,857	16.887	Two dikes destroyed; the other worthless.	Contraction.
		Two dikes repaired...	1892	1894	3,809.27	5,649.70				
9	Rob Roy....	One dike, permeable two-row pile built.	1891	1891	14,400.00	20,071.60	1,200	16.726	Nearly all of this covered by high sand bar.	Maintain channel through draw of Rob Roy bridge.
10	Red Fork....	Revetment, mattress 120 feet wide, riprap to 20-foot stage.	1895	1896	47,740.96	69,701.80	4,800	14.521	\$4,500 repairs needed	Bank protection.
					977,629.82					
		Plant purchased and built.....	1885	1898		120,766.84				
		Caney dam.....				694.94				
		Dredging and works for temporary relief, 1896, \$15,320.72.....				22,368.24				
		Expended, care of property, from allotment of 1877-78.....				304.51				
		Expended, care of property, fiscal year 1884.....				1,340.97				
						1,123,105.32				

FINANCIAL STATEMENT.

Allotted in 1877.....	\$10,000.00
Appropriated in 1878.....	10,000.00
Appropriated, 1881 to 1896, inclusive.....	1,108,500.00
Receipts from sales, 1886 to 1893, inclusive.....	5,033.50
	1,133,533.50
Unexpended July 1, 1898.....	\$5,973.39
Material on hand July 1, 1898.....	4,003.31
	9,976.70
	1,123,556.80
Amount expended as per exhibit.....	1,123,105.32
Discrepancy.....	451.48





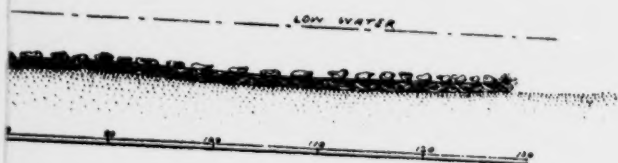


REVETMENT.

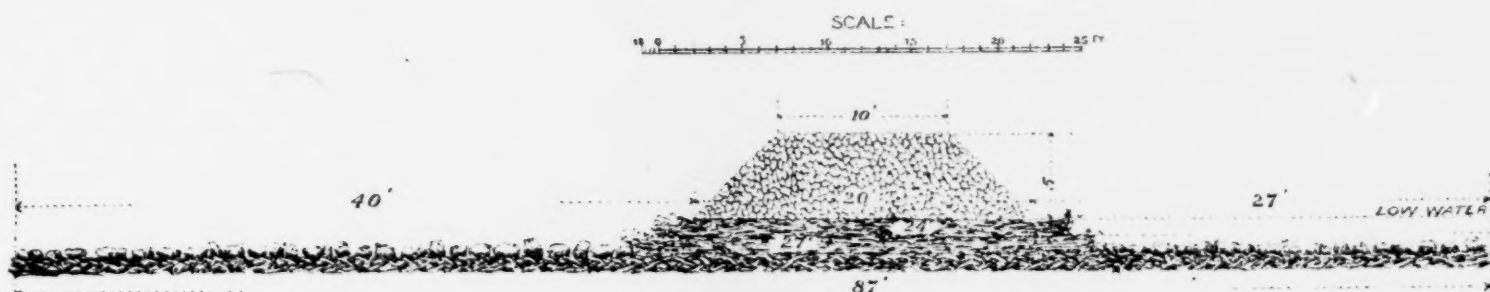
PLATE E.

OF CONSTRUCTION

It on the Missouri River about \$10.00 per linear foot



H Doc 150 56 2



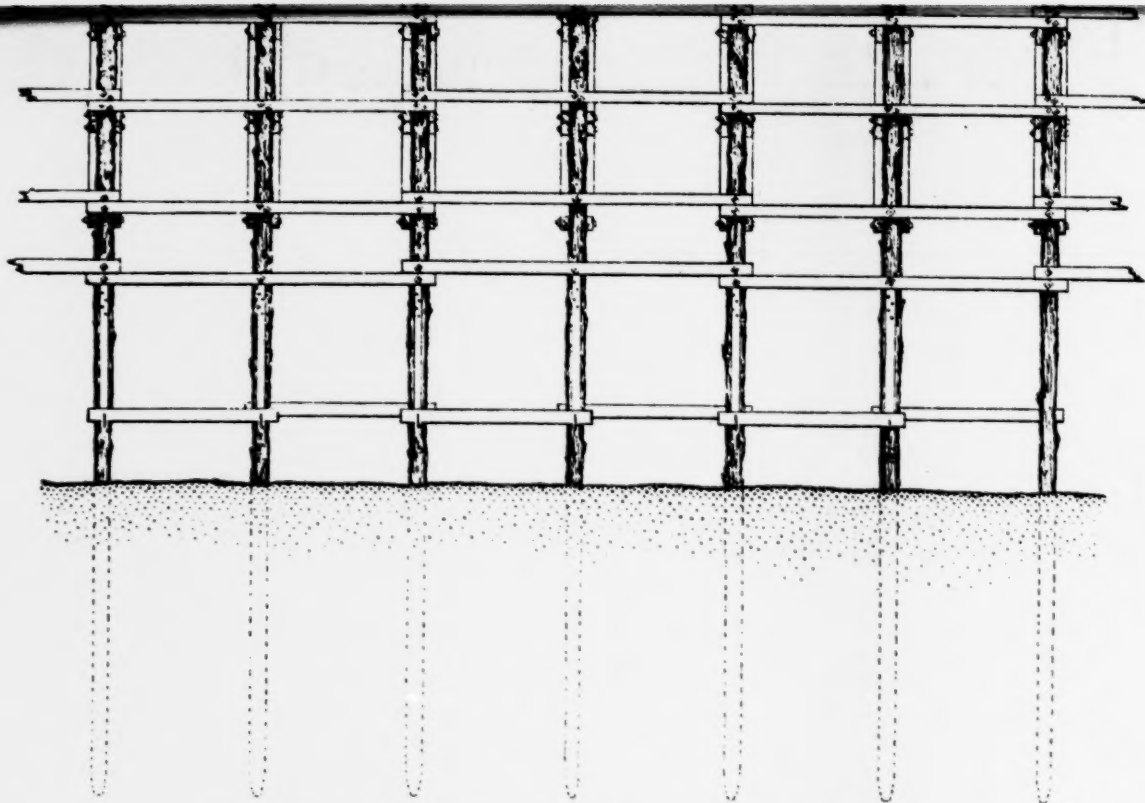
CROSS SECTION OF LOW DIKE

FOR LONGITUDINAL DIKES THE MAT SHOULD EXTEND 40 FEET OUTSIDE OF DIKE ON CHANNEL SIDE.
FOR CROSS DIKES THE MAT SHOULD EXTEND 40 FEET BELOW THE DIKE.

Estimate of cost per lineal foot of Dike.

87 sq. ft. of brush mat with stone ballast at 4 cents per ft.	3.48
51 cub. ft. of brush foundation at 2 " " "	1.02
75 cub. ft. of stone at 4 " " "	3.00
For material in place	7.50
For expense of plant administration etc. 33 1/3 %	2.50
Total	10.00

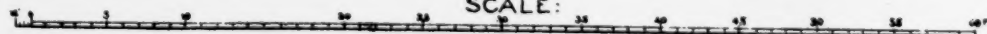
These dikes would vary in cost according to height. Their tops should be five feet above low water and no brush should be used above low water in the body of the dike. For estimate the depth at low water is taken at 3 feet giving a total height of 8 feet. In localities where the height is less, the mats for cross dikes might be reduced in width.



FRONT ELEVATION OF OUTER ROW OF PILES
OF
LONGITUDINAL DIKE.

SHOWING PROTECTION AGAINST DRIFT AND ICE.

SCALE:



ESTIMATE OF COST.

100 LINEAL FEET

17250 square feet of Mattress at 5 cents per sq. ft. in place	762.50
2500 lineal " " Piles " 15 " " " "	325.00
25 cords " Poles " 3 " " " "	75.00
19250 ft. B.M. " Lumber " 24 " " "	462.00
4000 lbs. " Iron Bolts 3" " lb.	120.00

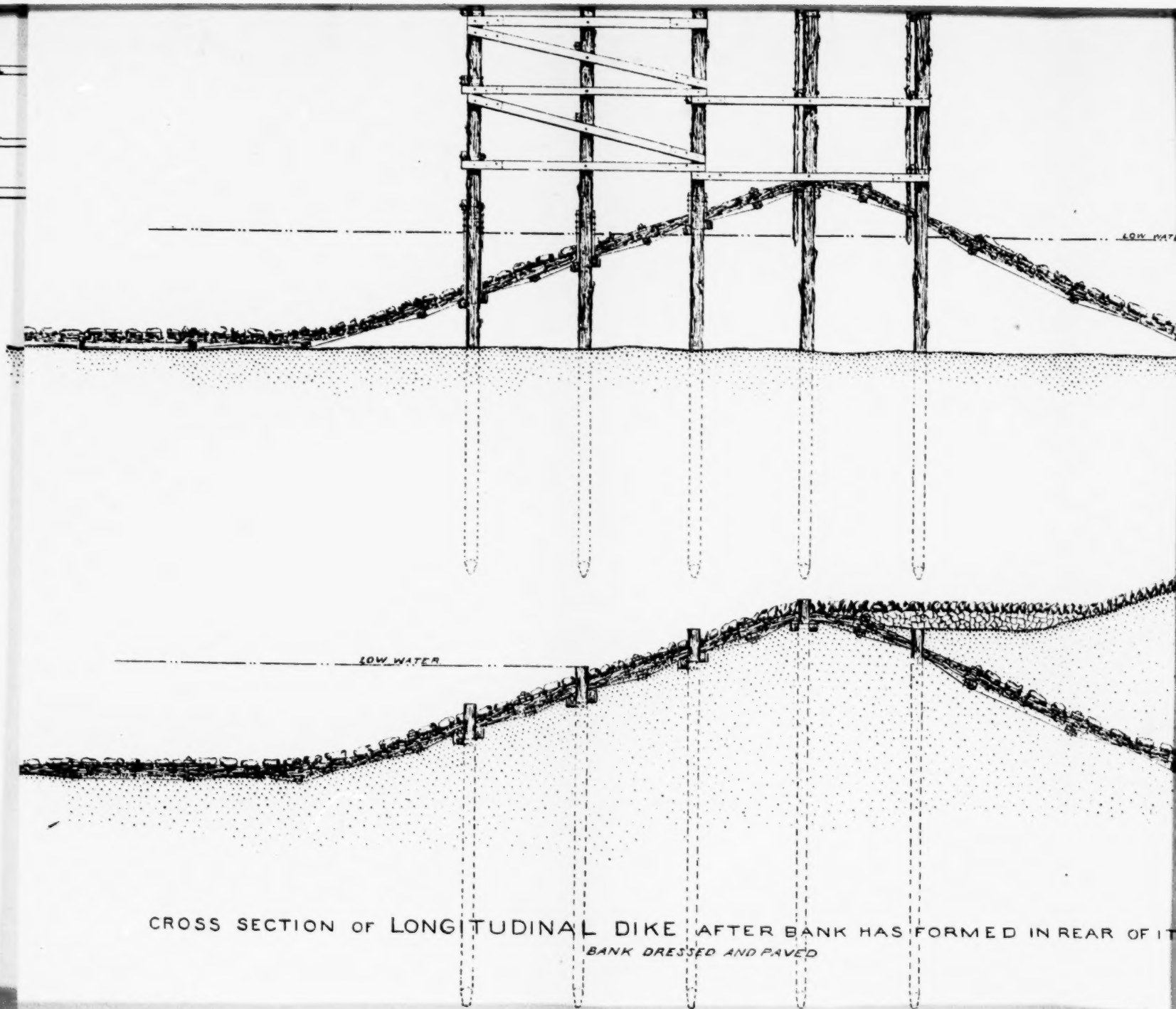
1744.50

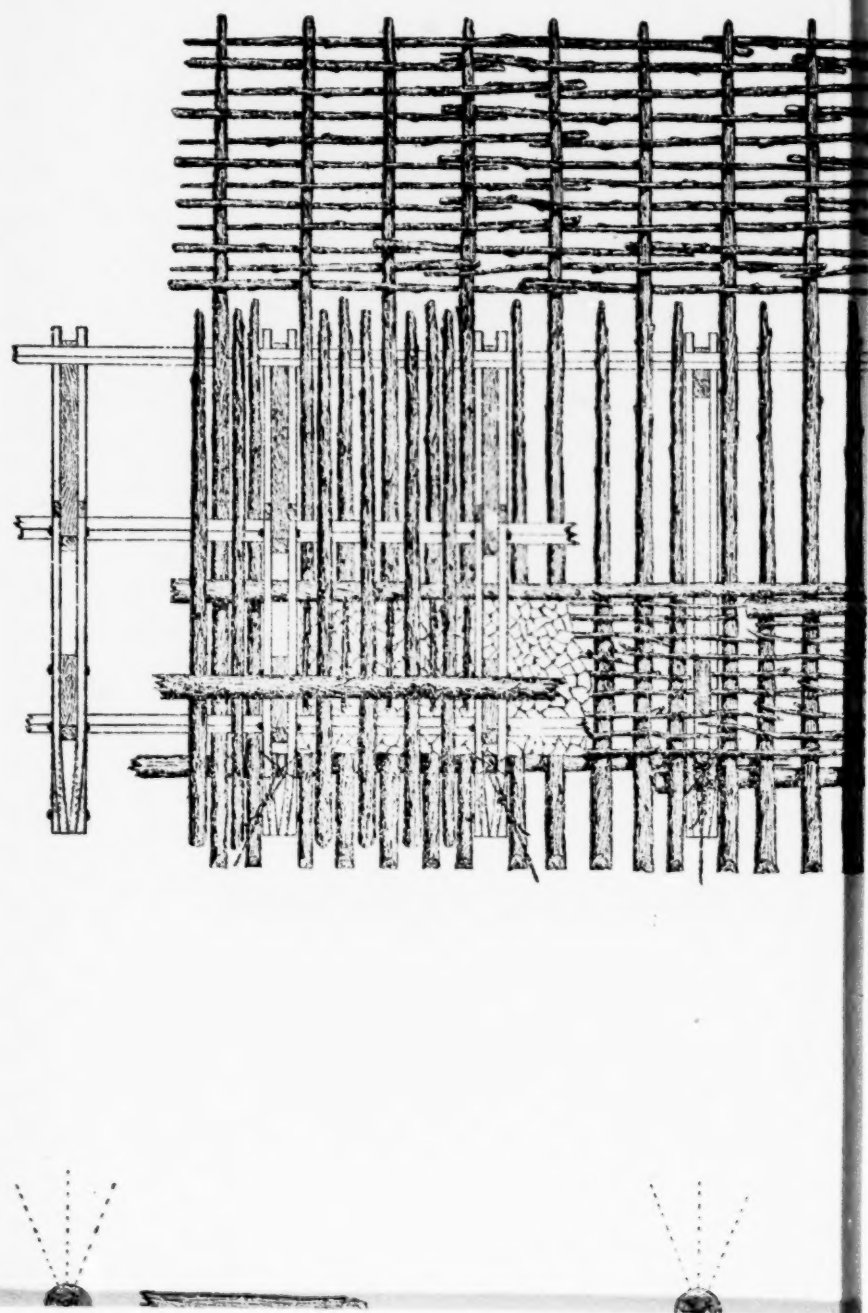
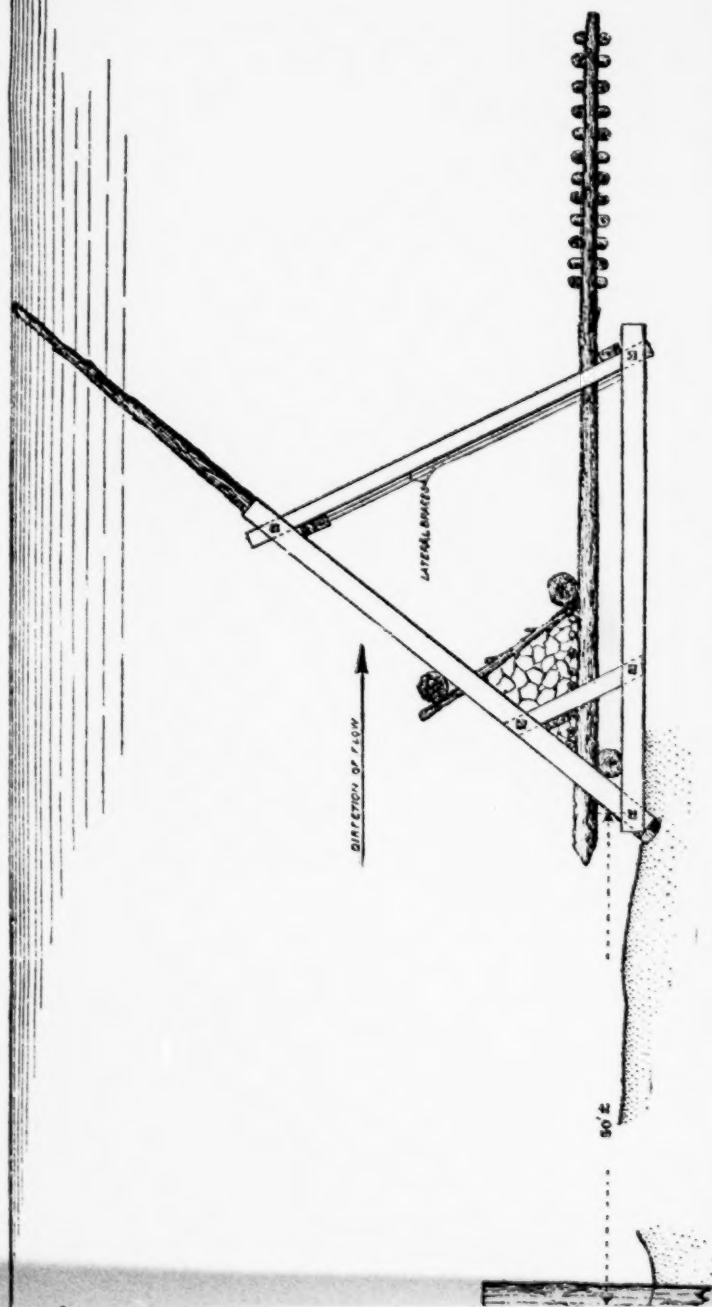
Stone Paving etc after Deposit

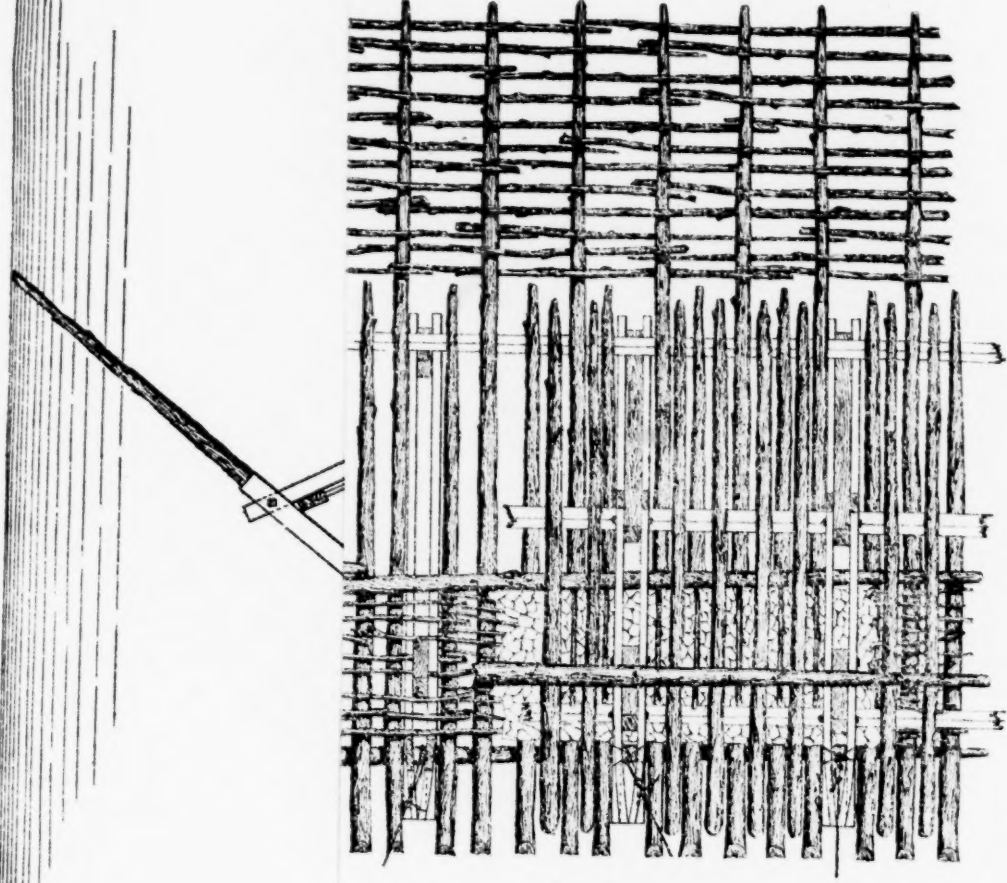
255.50

or \$20.00 per lineal foot

\$2000.00







REVERSED ABATTIS

GENERAL PLAN

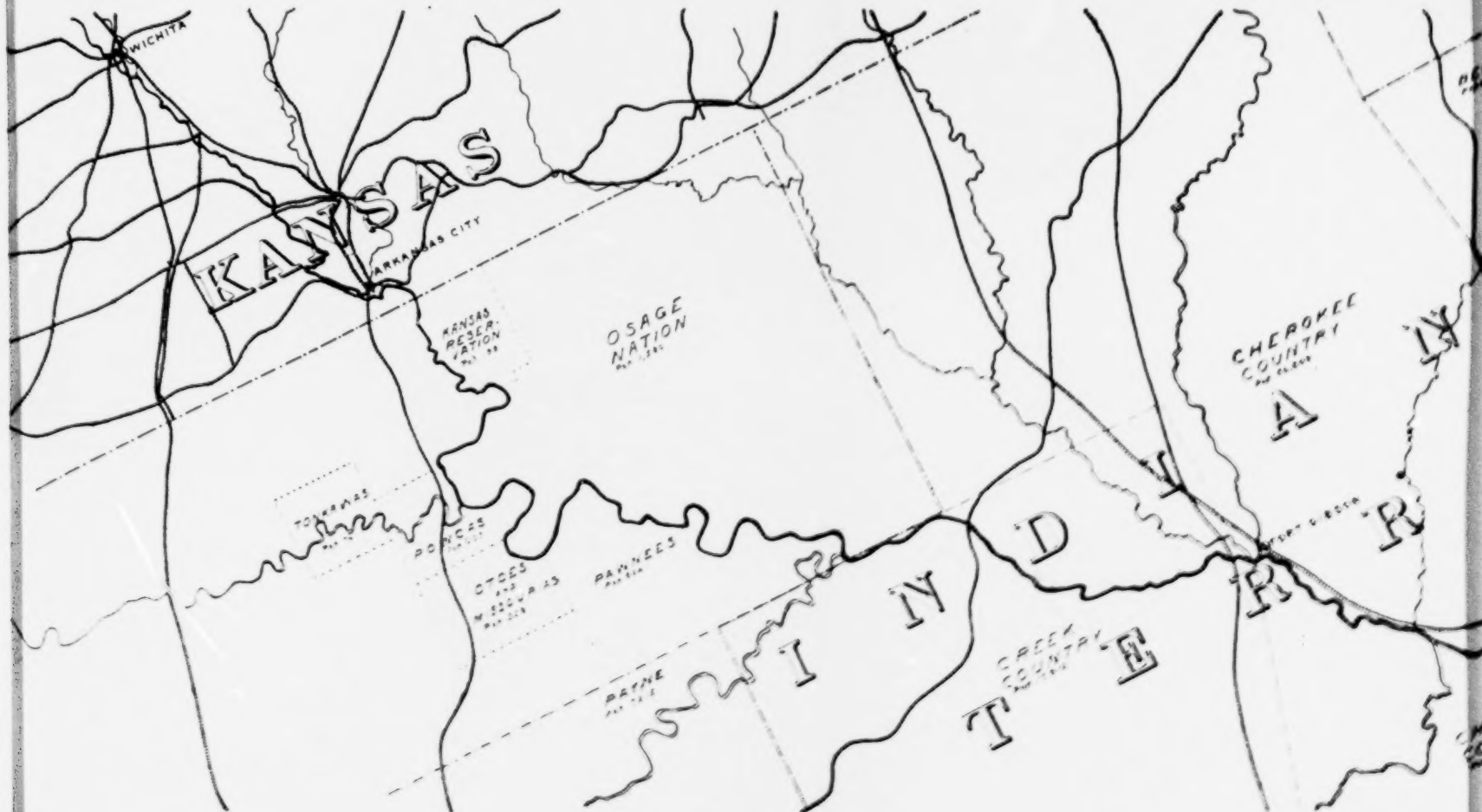
Size of parts depends on depth of water

*The abattis is designed as auxiliary to or as a substitute for Pile
Thrusts for closing subsidiary Channels by inclining natural deposit.*

ESTIMATE OF COST
2 1/2 dollars per square ft.

SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

PLATE H.



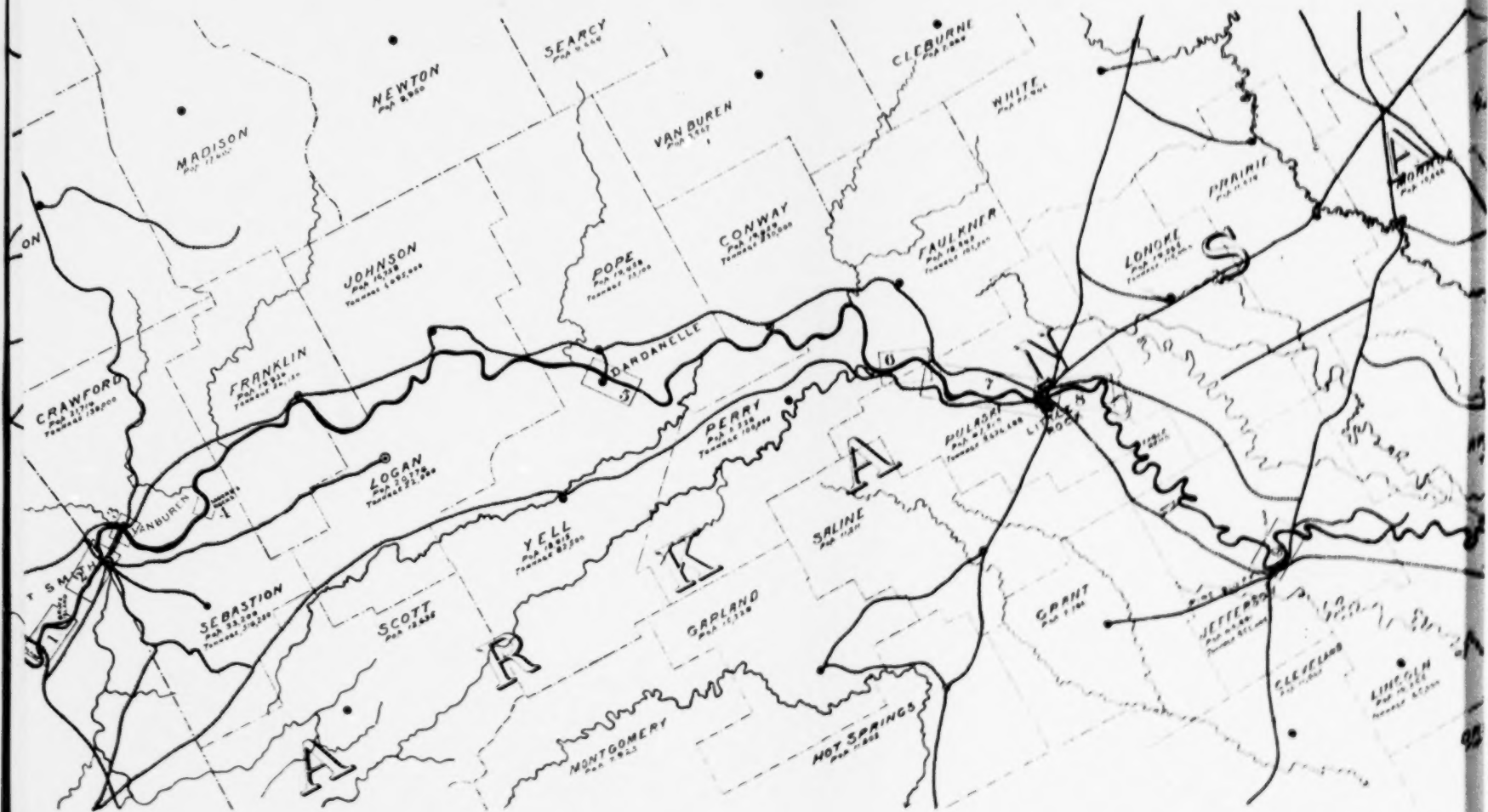
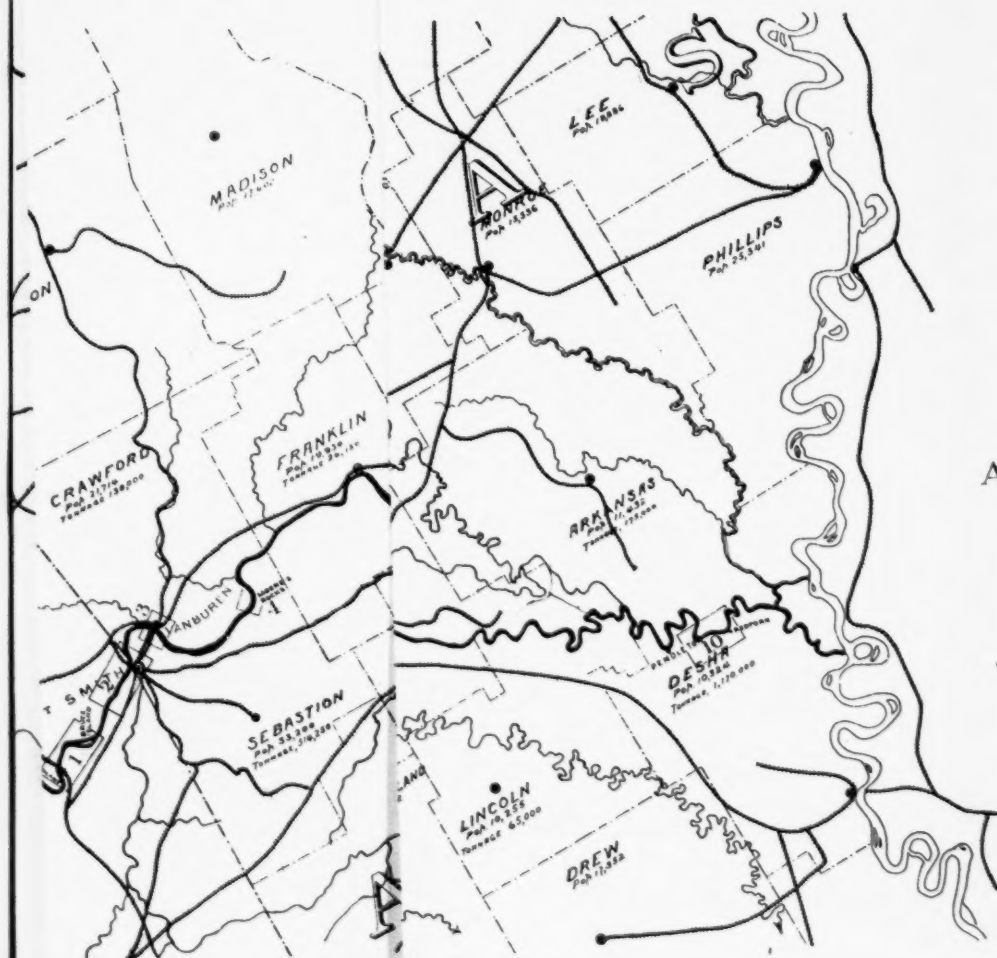


PLATE I



COMMERCIAL MAP of the COUNTIES IN THE ARKANSAS RIVER VALLEY

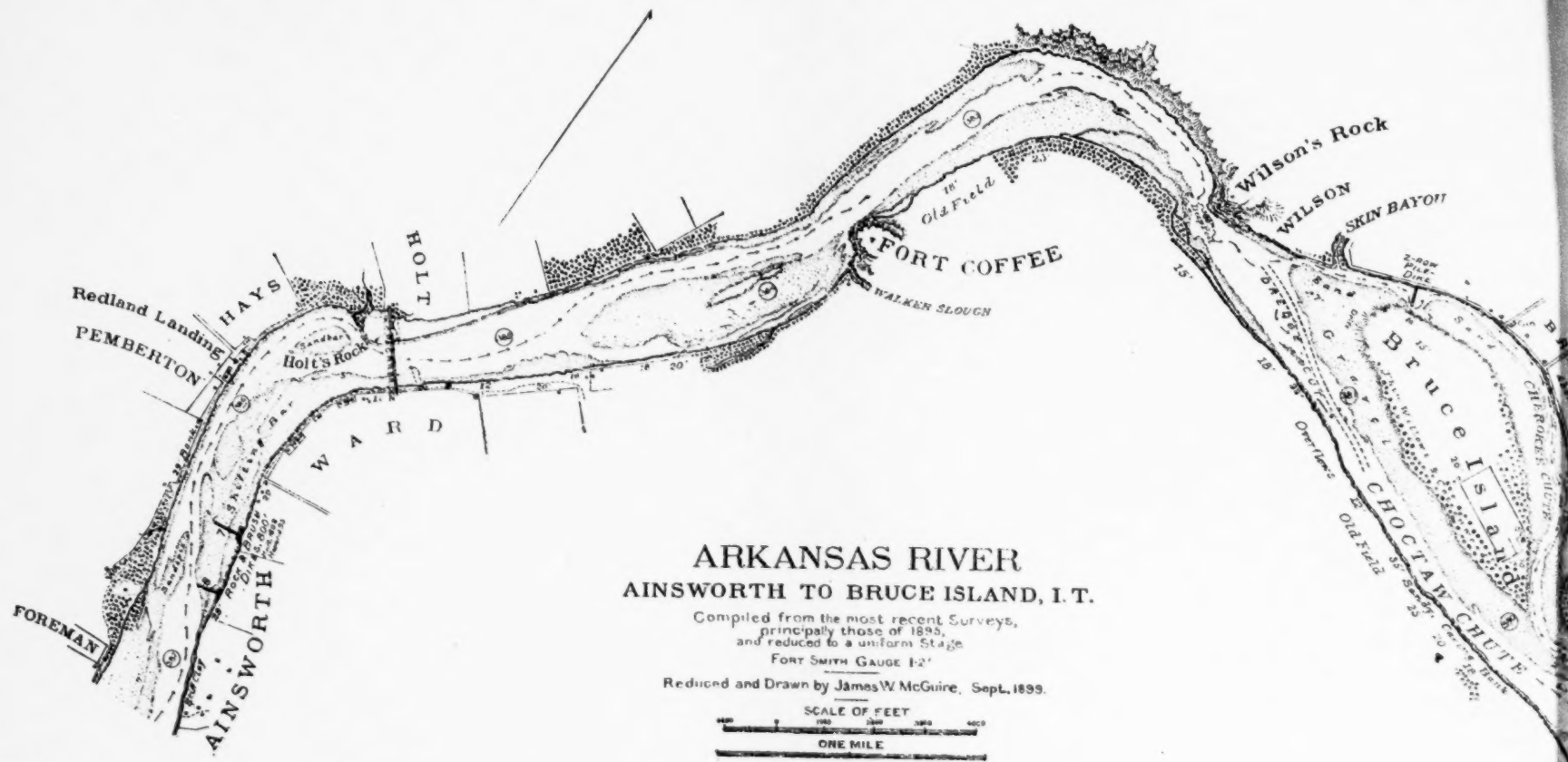
Population as given in Census Report for 1890
Tonnage as given in Arkansas River Commission
Report for 1893

PREPARED IN THE
U.S. Engineer Office, Little Rock, Ark.
NOVEMBER 17th, 1893



Note.—The small Parallelograms marked by Arabic Numerals
indicate Areas of which Detail Maps have been prepared to accompany
the Annual Report.

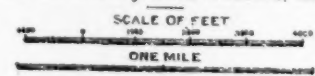
H Doc 710 56 2

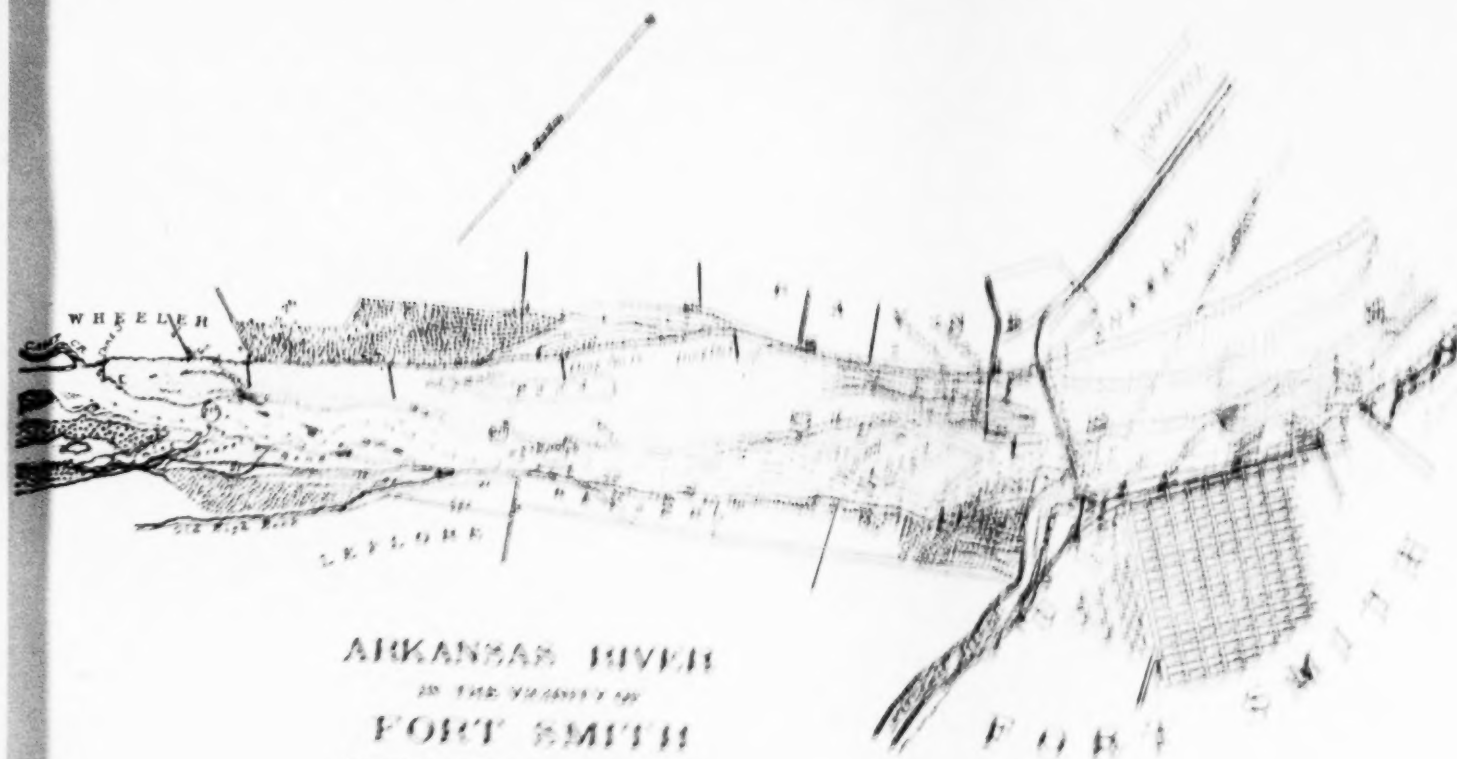


ARKANSAS RIVER AINSWORTH TO BRUCE ISLAND, I.T.

Compiled from the most recent Surveys,
 principally those of 1895,
 and reduced to a uniform Stage
 FORT SMITH GAUGE 1-2'

Reduced and Drawn by James W. McGuire, Sept. 1899.





ARKANSAS RIVER
IN THE VICINITY OF
FORT SMITH

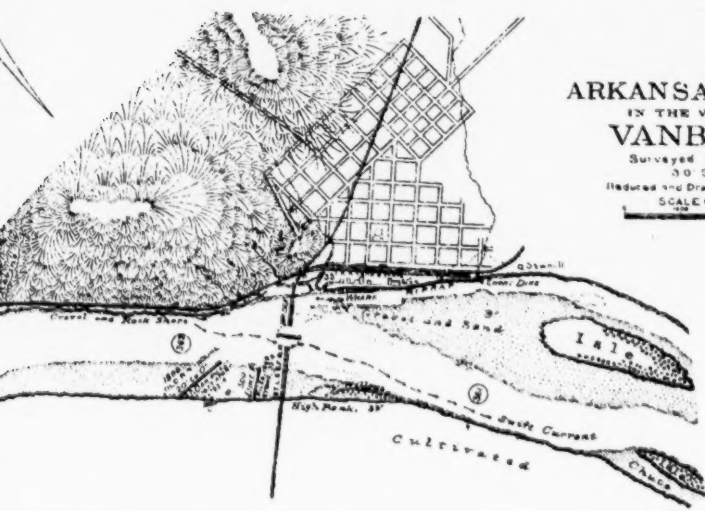
Compiled from the report of Capt. J. H. ...
and others.

Published by the War Department, ...

Scale 1:50,000

1877



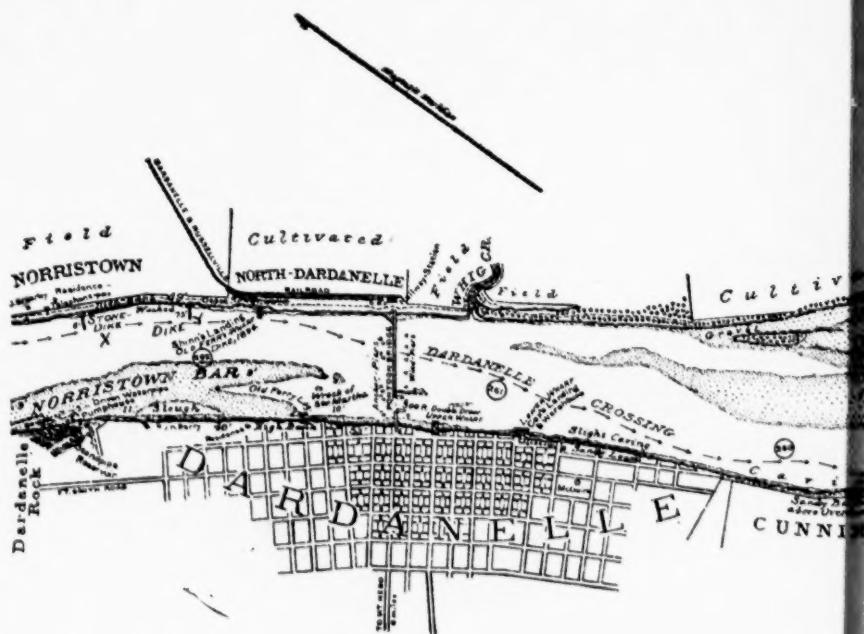


ARKANSAS RIVER IN THE VICINITY OF VANBUREN

Surveyed Sept 7, 1832.
30 STAGE

Reduced and Drawn by J. W. McGehee
SCALE OF FEET





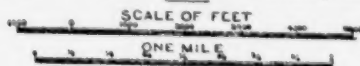


ARKANSAS RIVER IN THE VICINITY OF DARDANELLE

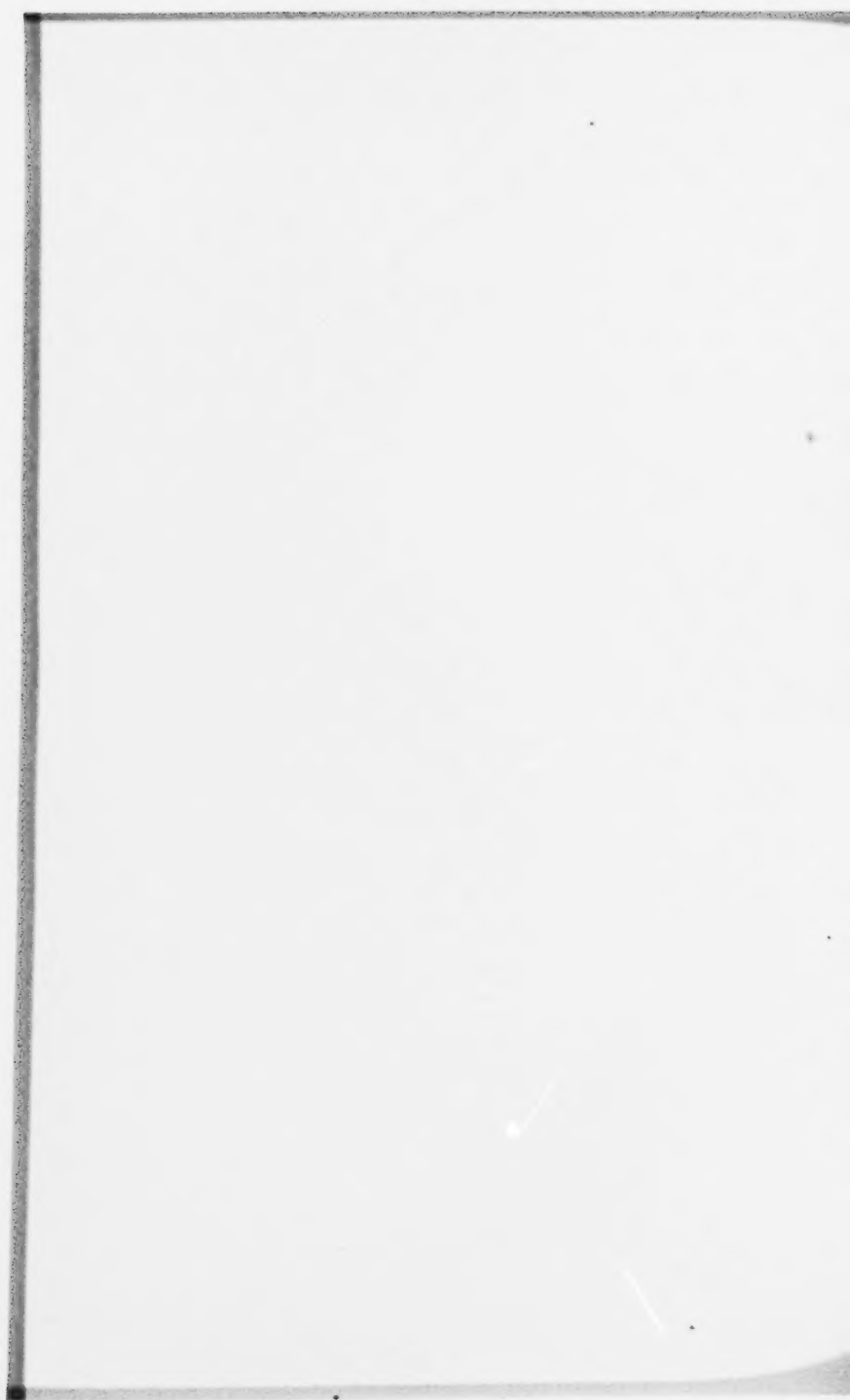
Surveyed June 30th, 1896.

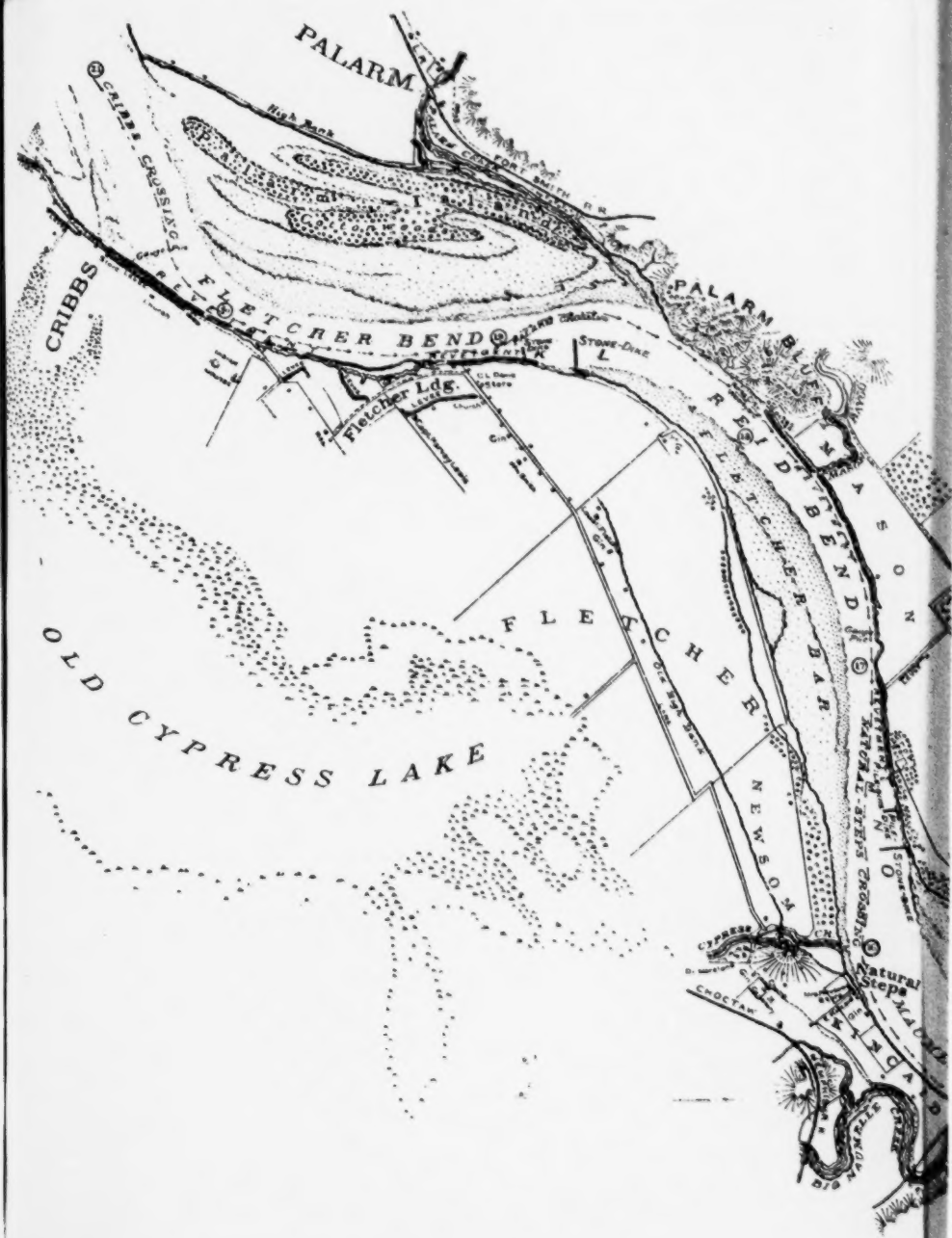
DARDANELLE GAUGE, 80'.

Reduced and Drawn by JAMES W. MCGUIRE, Sept., 1893.



439 (Plat of the Arkansas River, Little R

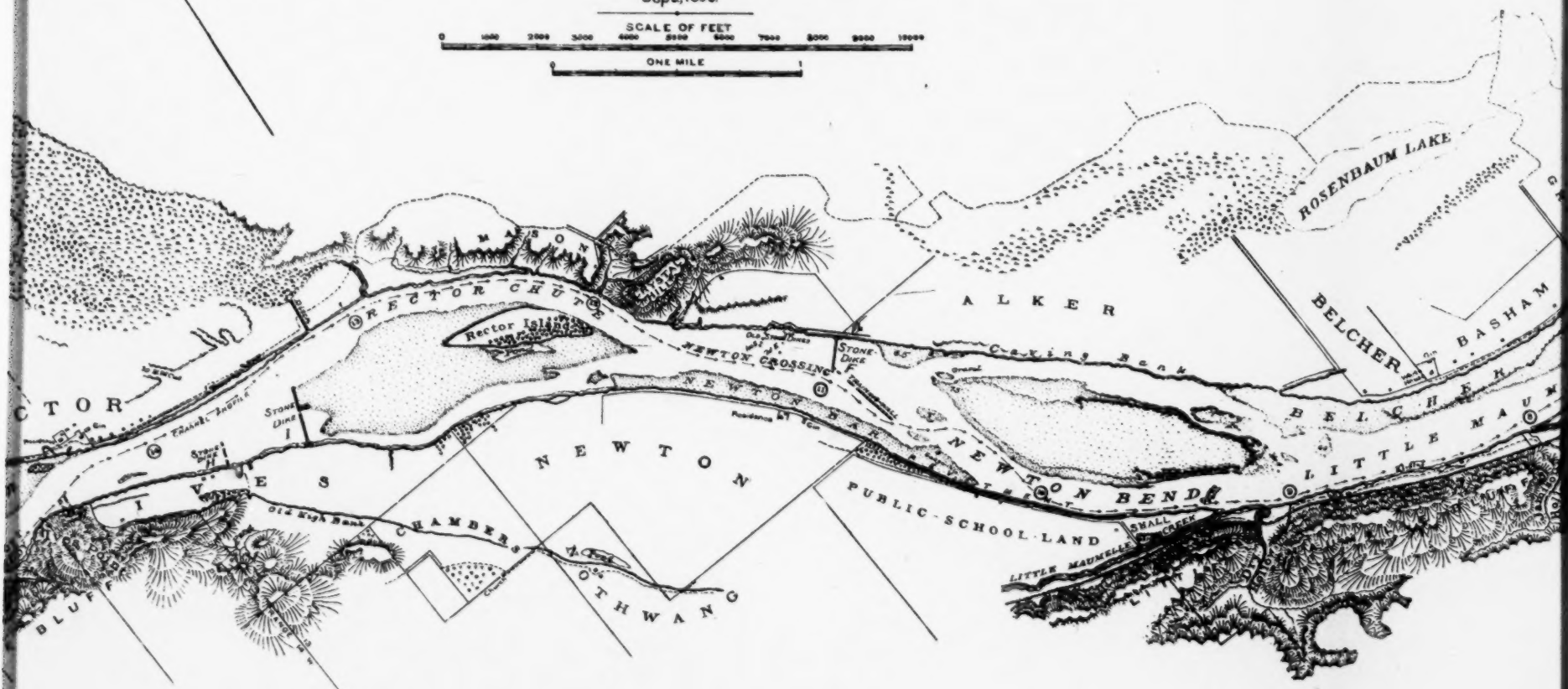


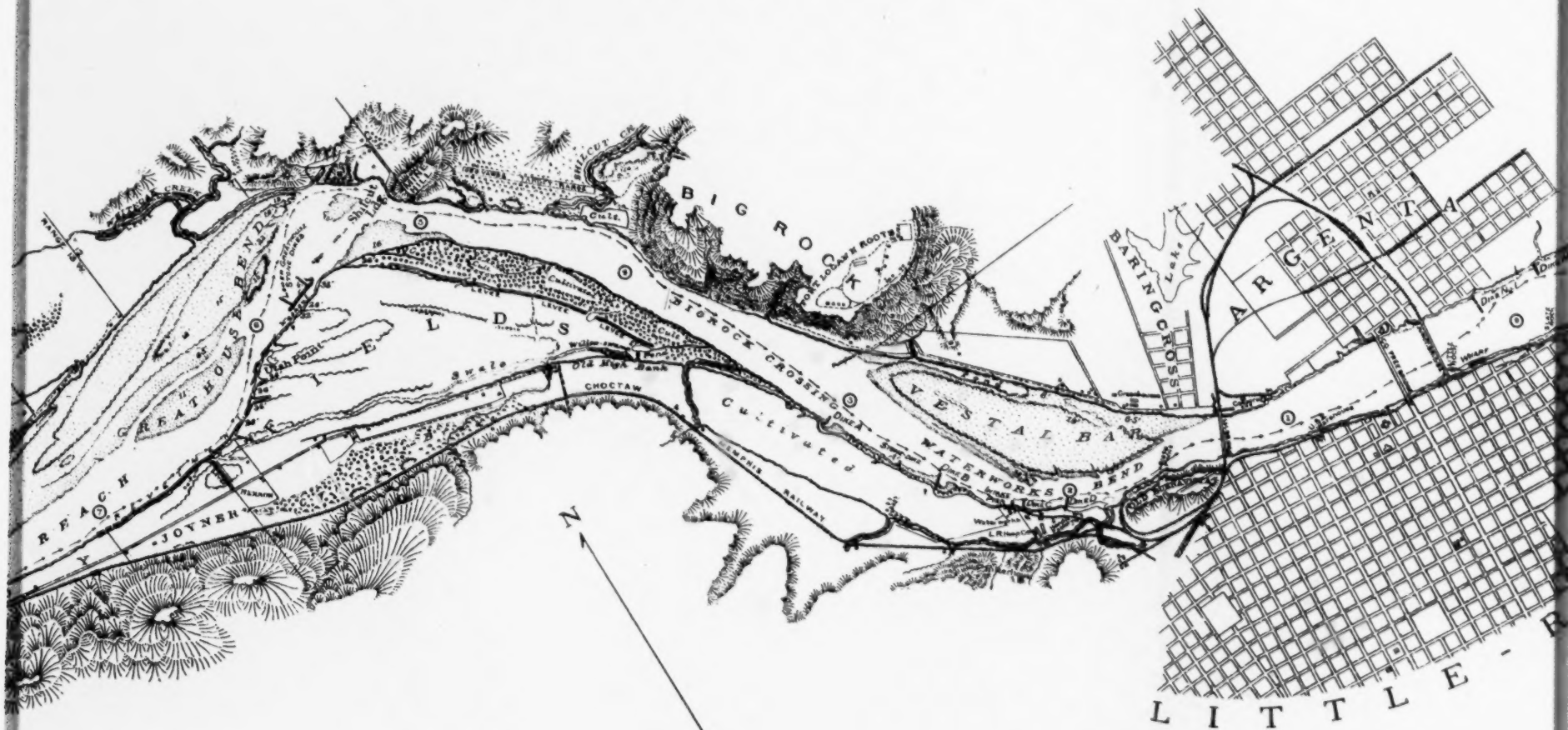


ARKANSAS RIVER LITTLE-ROCK TO CRIBBS

Survey Made in April, 1899
Stage of Water at End of Survey, as Shown by Little-Rock Gauge, 5.2 Feet

PANTOGRAPHIC REDUCTION
From Sheets 1 to 7, Inclusive, of Original Map.
DRAWN BY JAMES W. MCGUIRE
Sept, 1899.





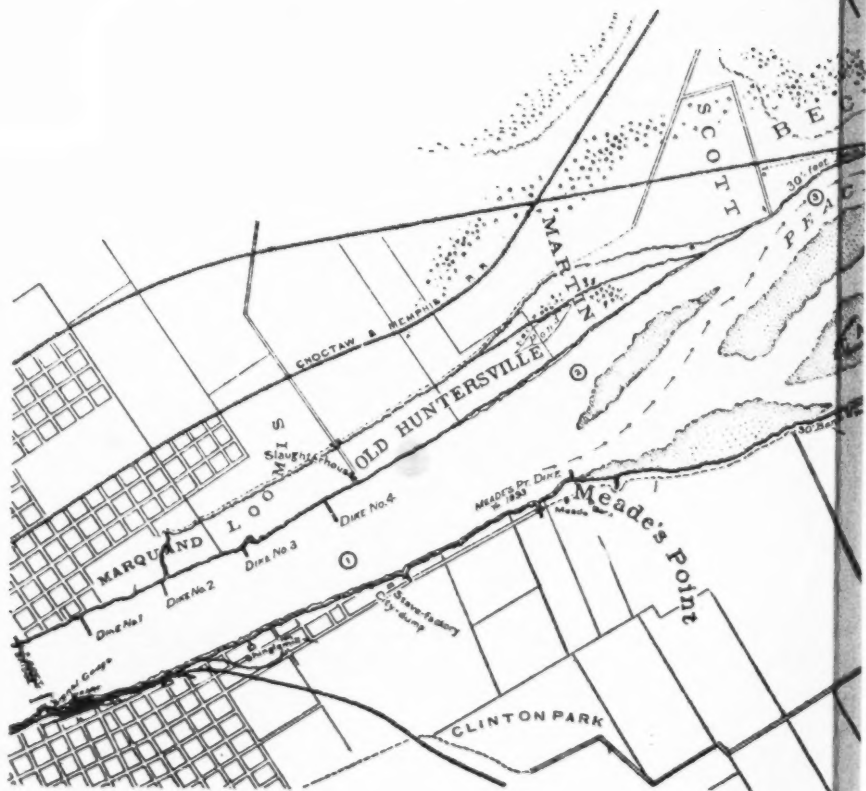


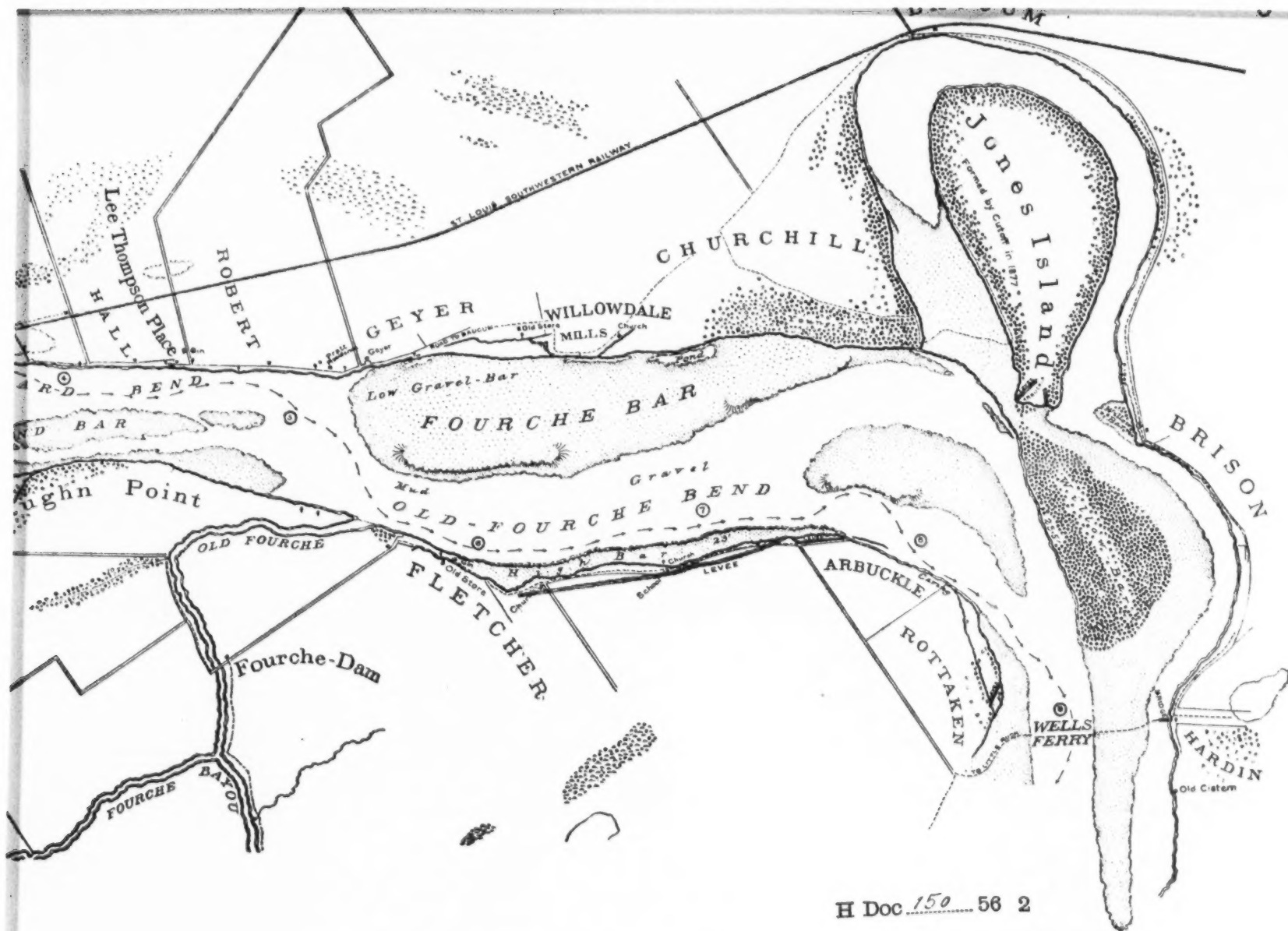
ARKANSAS RIVER

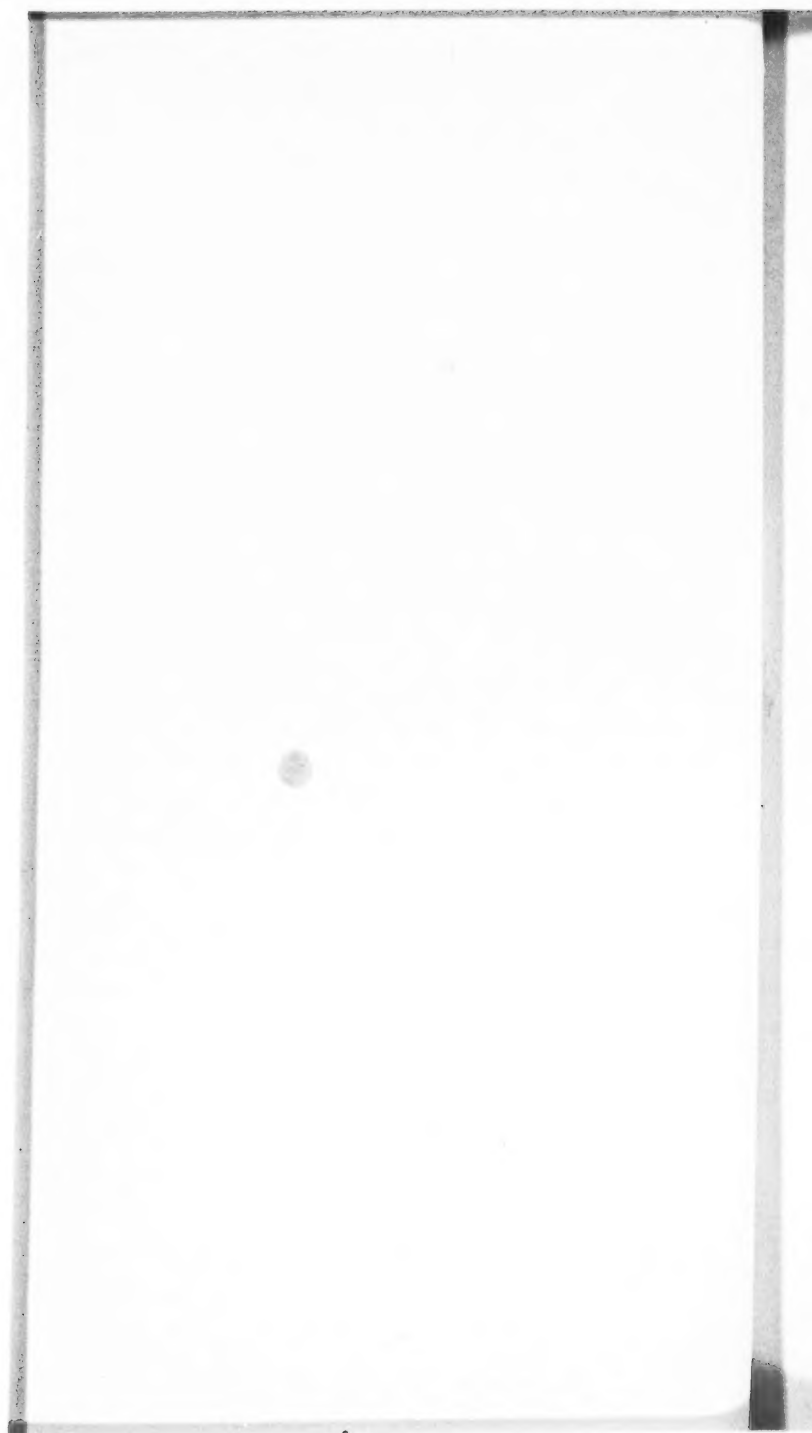
LITTLE-ROCK to WELLS' FERRY

Survey Made March 20-April 10, 1856, by A.D. Cohn
 SIGNAL-GAUGE 2 FEET
 Reduced and Drawn by J.W. McGuire, Sept. 1898

SCALE OF FEET





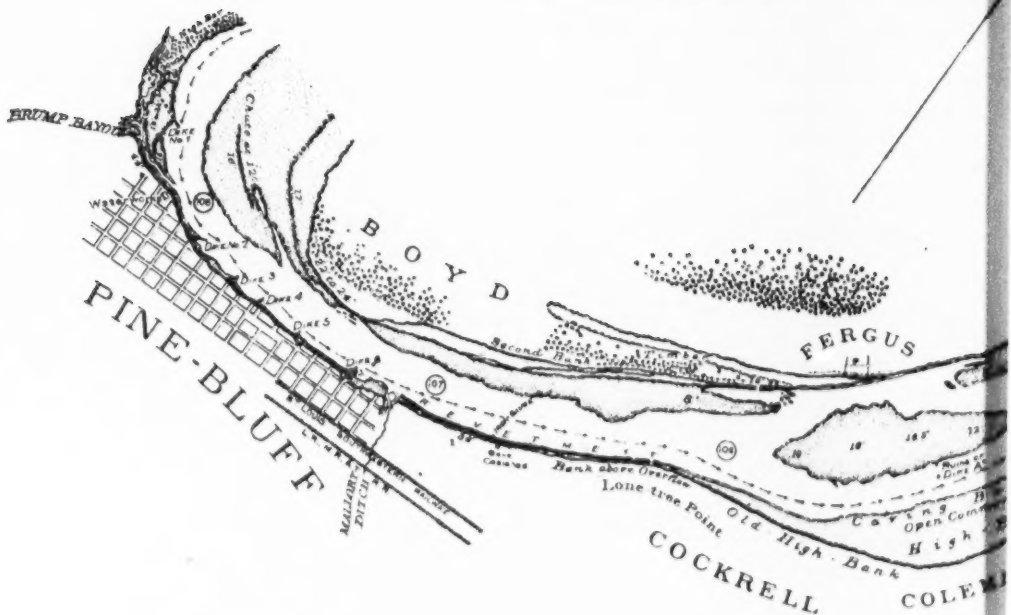
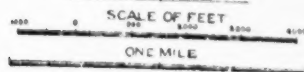


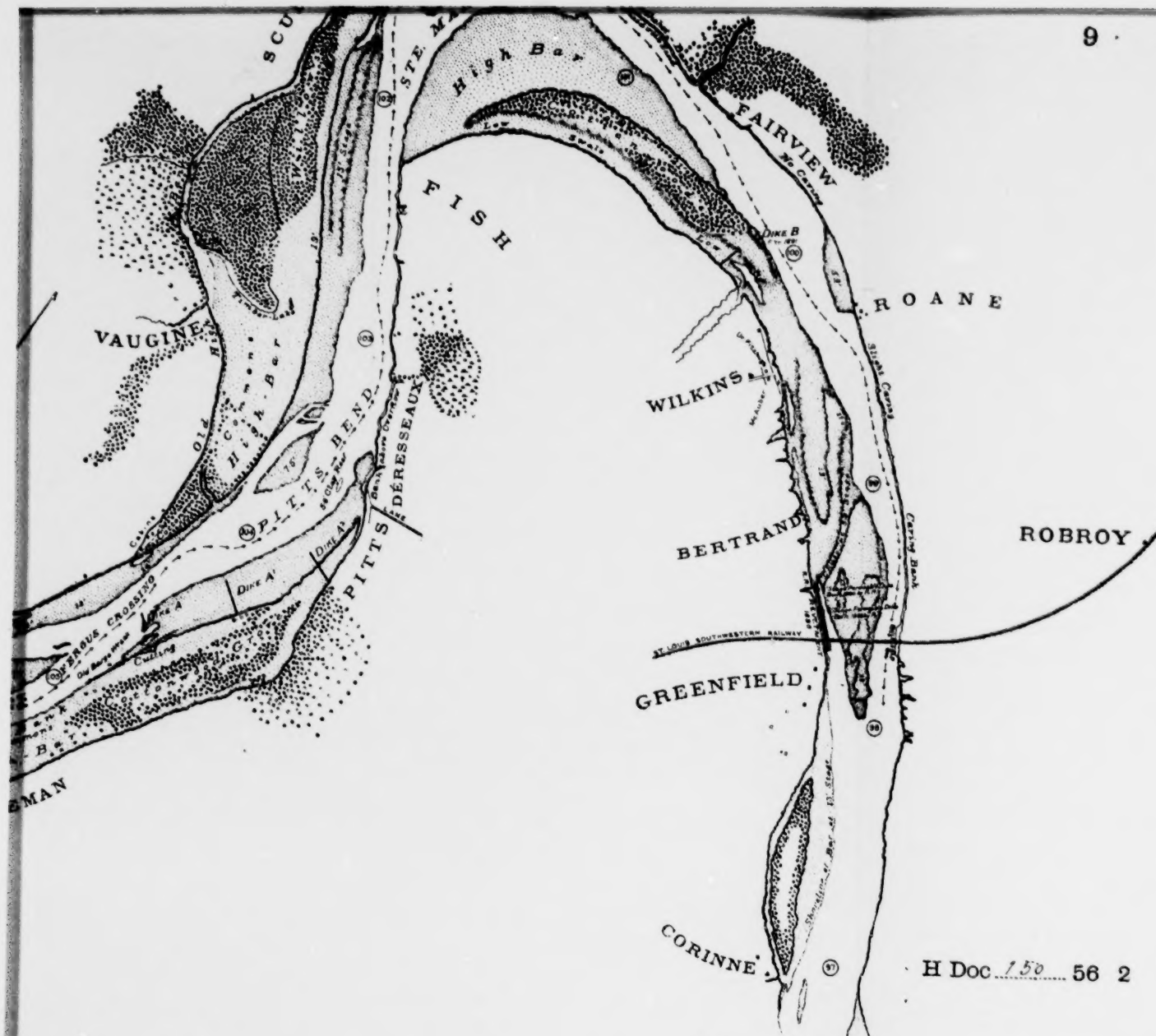
ARKANSAS RIVER PINE-BLUFF TO ROBROY

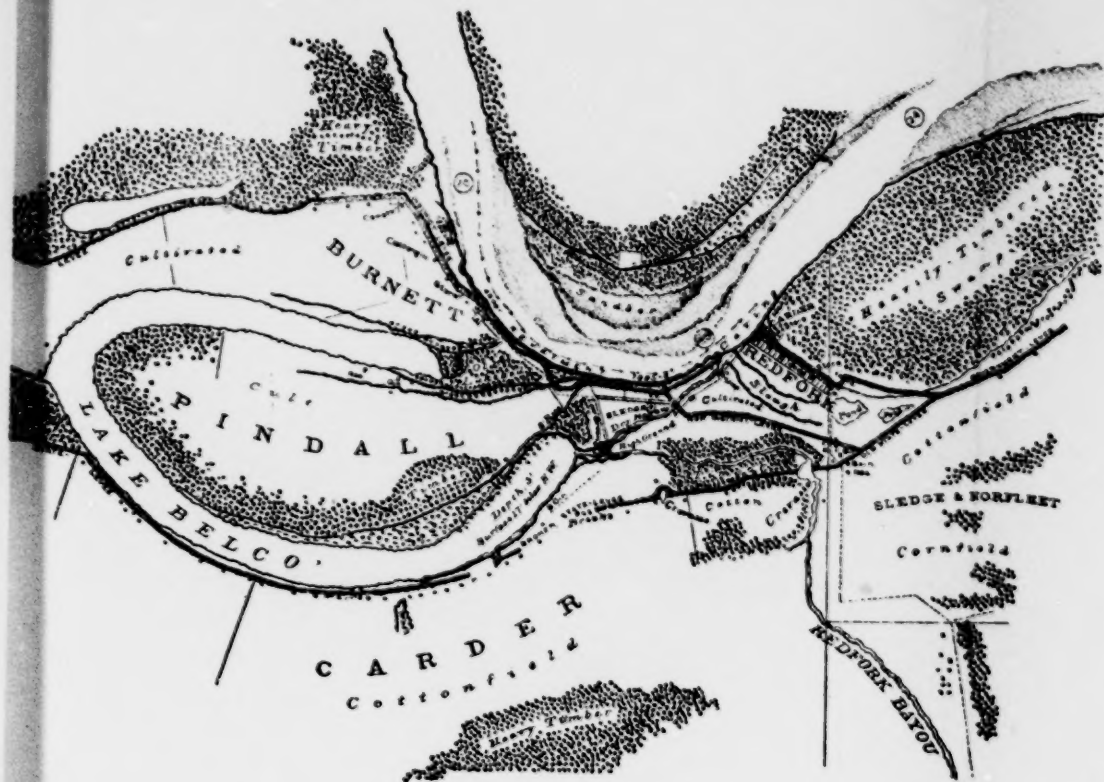
Survey of June 1826, 1896

PINE-BLUFF GAUGE, 8377

Reduced and Drawn by James W McGuire
Sept 1893







was suspended out of Pine Bluff from July 11, 1901 to August 8, 1901, and again from August 29, 1901, to December 16, 1901; and for a period of fifty three days navigation was suspended over the entire river. The channel depths during the lowest water were about 20 inches to Silver Lake, and about 12 inches above that place.

445 List of vessels that navigated Arkansas River May 31, 1901 to June 1, 1902.

Name	Ton-		Draft,		Loaded	Between	Round Passen-	
	nage	er	Ft in	Ft in			trips	gers
Elva	53		6	3	0	Dardanelle and Shoal Creek	3	
						Little Rock and Cadron	1	
Myrtle Corey	10	2	0	2	6	L. R. and Littles	3	
						LR and Ross Hollow	2	
						LR and Big Rock	87	
Annie Tardy	57	3	0	4	0	Pine Bluff and Caldwells	6	520
						LR and Pine Bluff	9	11
						LR and Littles	4	32
						LR and Fletchers	7	12
						LR and Union City	4	
						LR and Stouts	2	
Dardanelle	164	2	6	2	6	LR and Bells Camp	1	
						LR and Eagle	1	1
						Pine Bluff & Browns	3	
						PB and Plum Bayou	1	5
						Excursions out of Little Rock	18	3135
A. D. Allen	67	4	6	4	0	LR and Pine Bluff	22	1592
Chicago	33	1	8			Greenville and Foot		
						of Cut off	2	
Edith	7	2	0			Rosedale and Red Fork	40	
Carrie Clyde	60	3	0			Mouth to Coashka	1	
Lucille Newland	298	5	0			Memphis and points		
						below Pine Bluff	19	1267
J. N. Harbin	266	3	0			Memphis and Pine Bluff	15	
						Memphis and points		
						below Pine Bluff	20	953

a One way trip"

Government here offered in evidence as Exhibit 52 the following from annual report of chief of engineers for 1903:

"Fort Gibson, on the Grand River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, is the head of navigation, but no report was received of any navigation above Webbers Falls, 430 miles above the mouth, this fiscal year."

"The bed of the river consists of shifting sand, making the channel one of uncertain position. The volume of flow of the stream varies from approximately 600,000 cubic feet a second at minimum flood stage to 1,160 cubic feet a second at minimum low water, the ordinary low water flow being 2,700 cubic feet a second at Little Rock. Below Little Rock the low water flow increases until at the junction with White River (foot of cut-off) the minimum flow is 1,850 cubic feet a second and the ordinary low water flow is about 3,000 cubic feet a second. The flow of the river when at back-full stage at Little Rock (23 feet on Weather Bureau gauge) is 190,000 to 200,000 cubic feet a second, seventy times the ordinary low water flow. This shows the extent of the destructive influences that annually destroy any low water channels that may be developed during the preceding low water season."

"Commercial Statistics. No report was received of any commerce above Webbers Falls, Ind. T., nor between Fort Smith, Ark., and Roseville, Ark., 59 miles below."

446 Government here offered in evidence as Exhibit 53 the following from report of chief of engineers for 1904:

"During the low-water period of this fiscal year the channel depths over the crossings were 2 feet from the head of the cut-off up to and including Lower Reydell crossing, and 15 to 18 inches above that point. The Memphis and Pine Bluff packet was compelled to turn back at Victoria on November 30, and at Swan Lake, December 11, 19 and 28, on account of shoal water. Fort Gibson, on the Grand River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, is the head of steamboat navigation; however, no boat reports going above Webbers Falls (430 miles above the mouth) this fiscal year, nor was there any report made of any steamboat navigation between Fort Smith and Shoal Creek, 88 miles below."

"Commercial statistics. No report was received of any commerce above Webbers Falls, Ind. T., nor between Fort Smith, Ark., and Shoal Creek, 88 miles below. Swan Lake, 80 miles above the mouth, was the head of navigation during the period of lowest water this fiscal year. The Pine Bluff packet from Memphis could not get above that point during the month of December, 1903."

Government here offered in evidence as Exhibit 54 the following from annual report of chief of engineers for 1905, relating to Arkansas River:

“Commercial Statistics. No report was received of any navigation between Fort Smith and Cardens Bottoms, 125 miles below.” “Fort Gibson, on Grand River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, is the head of steamboat navigation.”

Government here offered in evidence as Exhibit 55 the following from page 448 of annual report of chief of engineers for 1906:

“Fort Gibson, on Grand River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, is the head of steamboat navigation. The duration of the navigable periods of the river vary greatly in different years. Occasionally there are periods of very low water when navigation will be suspended throughout the length of river and then there will be time when it was possible to maintain 3-foot navigation thru to Fort Gibson all the year. The navigation periods are of about the following averages:

	Months a year for 4 foot draft	Months a year for a 2-foot draft
Mouth to Swan Lake (80 miles)	5½	10
Mouth to Little Rock (174 miles)	5	9½
Mouth to Grand River (461 miles)	4	8

The range between extreme high water and extreme low water at Fort Smith, Ark., is 35.5 feet; at Little Rock, Ark., 28.5 feet, and at the mouth of the river where the stages are controlled by those of the Mississippi the extreme range is 53.7 feet.”

447 Also on page 1386 “Commercial statistics. No report was received of the business done by the Mary D, a boat that has been operating between Fort Smith, Ark., and Muskogee, Ind. T., during the past year.”

Government here offered in evidence as Exhibit 56, the following from page 475 or report of chief of engineers for 1907, reading exactly the same as the preceding year's report, and on page 1520 under the head “Commercial Statistics, No.

report was received of any commerce between Webbers Falls, Ind. T. and Muskogee, Ind. T., nor between Shoal Creek, Ark., and Fort Smith. Ark."

Government here offered in evidence as Exhibit 57 part of page 506 of report of chief of engineers for 1908, which is the same as the second paragraph of Exhibit 64, hereinafter set out, beginning with words "Fort Gibson, etc." and ending "range is 53.7 feet", at the end of Exhibit 64.

Government here offered in evidence as Exhibit 58 the following from annual report of chief of engineers for 1909, relating to Arkansas River:

"Contains the same paragraph as second paragraph of Ex. 64, beginning "Fort Gibson, etc" and ending "range is 53.7 feet".

Also, page 534:

"The Muskogee-Oklahoma Packet Company, which was organized for the purpose of operating a boat line between Fort Smith and Muskogee, built a boat but did no business during the year. The Little Rock Packet Company has been organized for the purpose of operating a boat line out of Little Rock. It has purchased two boats. The Arkansas River Packet Company became bankrupt during the year and the Memphis and Pine Bluff Company has taken its place."

Also on page 1577 of the district officer's report:

"When that report was written there seemingly was an effort being made to revive steamboat navigation on the river between Fort Smith and Muskogee, 92 miles above. A steamboat City of Muskogee, was built for that portion of the river, but it has done nothing during the year, having been laid up at Muskogee all that time or used as a sand dredger procuring sand for the building trades in that vicinity. The persons interested in the enterprise represent that the effort to navigate the river was abandoned because of the obstructions—natural and artificial—in the river above Fort Smith. The artificial obstructions complained of are bridges under which their steamboat could not pass. These have been referred to the department in the manner provided for by regulations. The natural obstructions complained of are rock and gravel reefs. As snagging operations seek only to render available the natural depths existing in a stream the

operations of the proposed snag boat would not increase the depths over the shoals complained of. Therefore, if the existence of those shoals is the cause of the failure to operate steamboats between Fort Smith and Muskogee the construction of the new snag boat can be delayed until some provision is made for the removal of the shoals. At present there does not seem to be only real necessity for the removal of the shoals referred to, for it does not appear that there is an actual demand for that which can be supplied by smaller boats than the City of Muskogee. There was no navigation above Webbers Falls—31 miles below Muskogee—during this fiscal year.”

449 The Government here introduces in evidence Exhibit 59, being House Executive Document No. 206, 61st Congress, 2nd Session, relative to Arkansas River, Arkansas and Oklahoma, which reads as follows, to-wit:

450 61st Congress, 2d Session,

House of Representatives Document No. 206.

Arkansas River, Arkansas and Oklahoma.

Letter

from

The Secretary of War,

Transmitting,

With a Letter from the Chief of Engineers, Report of Examination of Arkansas River from Fort Smith, Ark., to Tulsa, Okla.

December 6, 1909.—Referred to the Committee on Rivers and Harbors and ordered to be printed.

War Department,

Washington, December 6, 1909.

Sir: I have the honor to transmit herewith a letter from the Chief of Engineers, U. S. Army, dated 2d instant, together with a copy of a report from Maj. M. L. Walker, Corps of Engineers, dated June 19, 1909, of a preliminary examination, with “an estimate of the cost to make the same navigable”, of Arkansas River from Fort Smith, Ark., to Tulsa, Okla., made

by him in compliance with the provisions of the river and harbor act of March 3, 1909.

Very respectfully,

J. M. DICKINSON,
Secretary of War.

The Speaker of the House of Representatives.

War Department,
Office of the Chief of Engineers.
Washington, December 2, 1909.

Sir: I have the honor to submit herewith for transmission to Congress, report of June 19, 1909, by Maj. M. L. Walker, Corps of Engineers, on preliminary examination authorized by the river and harbor act approved March 3, 1909, of Arkansas River from Fort Smith, Ark., to Tulsa, Okla., with "an estimate of the cost to make the same navigable."

451 In compliance with the terms of the act estimates are submitted in this report of the cost of the permanent improvement of this section of the river by locks and dams and by a combination of locks and dams and open-channel work.

I concur in the opinion of the local officer, the division engineer, and the Board of Engineers for Rivers and Harbors that Arkansas River from Fort Smith to Tulsa is not worthy of improvement by the General Government at the present time beyond the occasional snagging operations, etc., provided for under the existing project for improving Arkansas River.

Very respectfully,

W. L. MARSHALL,
Chief of Engineers, U. S. Army.

The Secretary of War.

Preliminary Examination of Arkansas River from Fort Smith,
Ark., to Tulsa, Okla.

United States Engineer Office,
Little Rock, Ark., June 19, 1909.

Sir: I have the honor to report that a preliminary examination has been made of the Arkansas River from Fort Smith

to Tulsa in compliance with instructions contained in Department letter dated March 8, 1909, and the following adverse report thereon is submitted.

This examination is provided for in section 13 of act of Congress approved March 3, 1909, as follows:

The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the localities named in this section, as hereinafter set forth * * * Arkansas River, from Fort Smith, Arkansas, to Tulsa, reporting an estimate of the cost to make the same navigable.

The act does not set forth the degree of navigability desired.

Tulsa is 157 miles above Fort Smith and these reaches have been covered in the following-named reports of examinations and surveys:

Survey of Arkansas River from Fort Gibson to Wichita, Kans., 1886, House Executive Document No. 90, 49th Congress, 1st session.

Survey of Arkansas River, Fort Gibson to Little Rock, 1870, House Executive Document No. 295, 41st Congress, 2d session.

Improvement of Arkansas River, Wichita, Kans., to the mouth, 1888, House Executive Document No. 234, 50th Congress, 1st session.

Examination and survey of Arkansas River, source to mouth, 1900. House Executive Document No. 150, 56th Congress, 2d session.

In addition to these an examination of the river below Muskogee was made in 1907 by a Board. House Document No. 71, 61st Congress, 1st session.

The local changes in the river since these reports were rendered are not sufficient to cause any material change in the general characteristics of the river, and the information available through them, together with data on file in this office and the additional information gathered lately, afford a basis for the estimates called for by the act of Congress.

Physical characteristics.—In referring to the physical characteristics of the river between Fort Smith and Tulsa (157 miles) it is better to divide the river into three sections, thus:

First: Tulsa to the mouth of Grand River, a distance of 65 miles. In this section the river width between banks varies from 3,000 to 750 feet, the narrow width being in the lower 2

miles of the section. The average width for the entire section is 1,870 feet. The fall of the river in these 65 miles
452 is 134 feet or at the average rate of 2.06 feet a mile.

The ordinary low-water flow of the river at Tulsa is about 350 cubic feet a second; the minimum low-water flow is about 175 cubic feet a second. There are no tributaries between Tulsa and the mouth of Grand River worthy of note save the Verdigris River, which enters from the north 1 mile above Grand River. At Tulsa the range between high and low water is 16.9 feet, the limiting gauge readings being 18 feet in May, 1908, and 1.1 feet in August, 1900, in January 1901, and in September, 1901. The bed of the stream is sand and gravel overlying rock, the latter frequently only 3 to 5 feet below low water. The ordinary low-water channel depths are 6 to 12 inches over the shoals. The general height of the banks varies from 14 to 18 feet in the upper reaches to 20 and 22 feet in the lower reaches.

Second: Mouth of Grand River to mouth of Canadian River, a distance of 37 miles. In this section the river width between banks varies from 2,100 to 800 feet. The average width for the entire section is 1,350 feet. The fall of the river in these 37 miles is 45 feet or at the average rate of 1.22 feet a mile. The Grand River at the head of this section is the most important tributary to the Arkansas River. It, the Grand, has an ordinary low-water flow of 500 cubic feet a second and a minimum low-water flow of 300 cubic feet a second; while the main Arkansas above the Grand and Verdigris rivers has only about 350 and 175 cubic feet a second as corresponding flows. The corresponding flows of the Verdigris are 150 and 25 cubic feet a second. The combined flows of the upper Arkansas, the Verdigris, and the Grand rivers give for the section between Grand and Canadian rivers an ordinary low-water flow of about 1,000 cubic feet a second. The ordinary range between high and low water is 30 to 32 feet. The bed of the stream is in general sand and gravel. The ordinary low-water channel depths are 12 to 18 inches over the shoals. Although there are three rock reefs in this section the depth to rock below low water is uniformly greater than above the mouth of Grand, it being from 8 to 18 feet below low water, where known.

Third: Mouth of Canadian River to Fort Smith, a distance of 55 miles. In this section the river width between banks varies from 2,900 feet to 900 feet. The average width for the entire section is 1,810 feet. The fall of the river in these 55 miles is 59 feet, or at an average rate of 1.07 feet a mile. The ordinary low-water flow is about 1,250 cubic feet a second be-

low the mouth of the Canadian, increasing to about 1,500 cubic feet a second at Fort Smith, and the minimum low-water flow is about 650 cubic feet a second below the mouth of the Canadian, increasing to about 750 cubic feet a second at Fort Smith. The ordinary low-water depths in the channels over the shoals are 12 to 24 inches. Where rock bottom is known it is from 12 to 28 feet below low water.

Estimates of cost to make navigable.—In treating the question of cost to make navigable it is better to divide the river into two sections: First, from Tulsa to the mouth of Grand River; and second, from the mouth of Grand River to Fort Smith.

Tulsa to mouth of Grand River, 65 miles.—The steep slope, the small low-water flow, and the shifting sands and gravel in the bed of the river preclude any possibility of improv-

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453 ing it by means of regulation works so as to afford a channel that would be of any worth for navigation purposes; therefore no estimate for improvement by that method is submitted. The steep slope, 2.06 feet a mile, indicates that in an improvement by means of locks and dams, fixed dams with lifts of 15 to 18 feet should be used; but in this instance, where the average height of the banks is small and the ordinary range between high and low water is about 15 feet, it would not be a good policy to use these large lifts, but instead lifts of only 7 to 8 feet should be used. On account of the great quantity of sand and other materials that are moved along the bed of the stream during high stages, the pools from fixed dams would silt up rapidly, hence, movable dams to afford a freer movement of the silt should be provided, even if the commerce of the river would not require such dams. Regardless of the type of dam used, one dredge will be needed the greater portion of each year to dredge channels through the pools. With fixed dams effort would be made to locate the dams in comparatively wide reaches of river in order to obtain as large a spillway as possible. With movable dams effort would be made to obtain suitable locations in narrower reaches in order to make the dams as short as possible. With the foregoing statements in view, three estimates are prepared for improvement by locks and dams—one by fixed dams of 15-foot lift, one by fixed dams with 8-foot lift, and one by movable dams with 8-foot lift.

In the case of the fixed dams the locks are taken as 36 by 180 feet to accommodate only one boat at a time, and the lengths of the dams are averaged at 1,900 feet. Regarding the movable

dams it is assumed that such dams will not be built unless there is a very large commerce to be provided for, in which case larger locks will be needed. Therefore the size of the locks in the movable dams is taken as 55 by 342 feet to accommodate one tow boat and three barges at a time. The movable sections are taken as having a navigation pass 248 feet wide and a discharge weir 600 feet wide. The remaining width of the river is considered as being taken up with a concrete dam, the average length of which is taken at 645 feet, making the average width of the river at probable suitable sites as 1,565 feet. It will be noticed that the lock and movable dam is of the same dimensions as those used on the Kana-wha River and the same as used by the special board in making report of the Arkansas River from its source to the mouth in 1900. The estimates of cost are as follows:

	Fixed dam, 15-foot lift.	Fixed dam, 8-foot lift.	Movable dam, 8-foot lift.
Surveys	\$3,500	\$2,000	\$2,000
Lock	75,000	60,000	190,000
Navigation pass			72,000
Discharge weir			120,000
Fixed dam	190,000	166,250	71,000
Abutment	25,000	22,250	17,000
Houses and grounds	12,500	12,500	17,000
Plant apportionment	17,500	13,000	13,000
Bank protection works	80,000	80,000	80,000
Cost of one lock and dam	403,500	356,000	582,000
Number required	9	17	17
Cost of the series	3,631,500	6,052,000	9,894,000
One dredge	150,000	150,000	150,000
Total first cost	3,781,500	6,202,000	10,044,000

454

Estimate for operation and maintenance.

	Fixed dams, 15-foot lift.	Fixed dams, 8-foot lift.	Movable dams, 8-foot lift.
Interest on investment at 2 per cent.	\$75,630	\$124,040	\$200,880
Annual operation and maintenance of the locks and dams	121,500	182,920	297,500
Annual operation and maintenance of dredge	43,500	43,500	43,500
Total annual cost	240,630	350,460	541,880

Water-power worth.—With the fixed dams of 15-foot lift and a minimum flow of 175 cubic feet a second the net horsepower delivered by a water turbine would be about 200. Between Tulsa and the mouth of Grand River this minimum would extend over about one month. During the remaining eleven months of a year the minimum net horse power would be about 350, with a probability of three weeks suspension on account of high water. In this territory there is an abundance of natural gas and coal and a surplus of crude oil available for fuel, conditions which make the value of water power not over \$1 year horsepower or not over \$350 a year a dam, and it is more than likely that there will not be any demand for it at that price, hence, there is no revenue estimated.

Mouth of Grand River to Fort Smith, 92 miles.—Between the mouth of Grand River and Fort Smith, the larger volume of flow and the flatter slope make it possible to obtain by means of regulation works and dredging a navigable channel having a dept of $2\frac{1}{4}$ to $2\frac{3}{4}$ feet during ordinary low water for a boat not over 35 feet wide. Because of the higher banks, fixed dams of 15-foot lift not be so objectionable as above the mouth of Grand, provided, wide reaches of river are selected for their locations. Because of the greater depths to reliable foundations the movable dams should have higher lifts than those in the upper river in order to reduce the number needed, with these statements as a basis, three estimates are submitted for improving the river between the mouth of Grand River and Fort Smith: First, by regulation works and dredging to obtain a $2\frac{1}{2}$ -foot channel at ordinary low water for a boat not over 35 feet wide; second, by fixed dams with locks of 15-foot lift to obtain a 4-foot channel at minimum low water for a boat with a tow not over 75 feet wide; and third, by movable dams with locks of 10-foot lift to obtain a 5-foot channel at minimum low water for a boat with a tow not over 75 feet wide. In the case of the open-river regulation the intent is to hold the caving bends by revetment, to place directing works on the heads of the bars at the foot of the bends, and to close channels behind island and high middle bars, and to use two hydraulic dredges in opening channels through the shoals. In the case of the locks and dams, the fixed dams are taken as having an average length of 2,000 feet and the movable dams as being located at sites the average width of which is 1,565 feet. The size of the locks is taken as in the estimates for those above

the mouth of Grand River. The estimates are as follows:

455

For regulation works and dredging.

160,000 linear feet of revetments, at \$10.....	\$1,600,000
50,000 linear feet of dikes, at \$12.50.....	625,000
10,500 linear feet of dams, at \$37.50.....	393,750
3,700 linear feet of rock channel excavation, at \$85.....	314,500
Total.....	2,933,250
Two hydraulic dredges, at \$150,000.....	300,000
Grand total.....	3,233,250

For locks and dams.

	Fixed dams, 15-foot lift.	Movable dams, 10-foot lift.
Surveys.....	\$4,500	\$3,500
Lock.....	85,000	227,000
Navigation pass.....		80,000
Discharge weir.....		136,000
Fixed dam.....	220,000	152,000
Abutment.....	33,000	18,000
Houses and grounds.....	12,500	17,000
Plant apportionment.....	20,000	15,000
Bank protection.....	106,000	106,000
Cost of one lock and dam.....	\$481,000	\$754,500
Number required.....	7	11
Cost of the series.....	\$3,367,000	\$8,299,500
One dredge.....	\$150,000	\$150,000
Total cost of locks and dams.....	\$3,517,000	\$8,449,500

Estimate for Annual Operation and Maintenance.

For regulation works and dredging.—One suitable equipment of plant for one working party constructing the regulation works will cost \$98,500. One such party in one year can build works aggregating \$125,000 in cost, at which rate twenty-four years' time will be required to exhaust the estimate. In addition to this the care and maintenance, including renewals, of one such plant during high-water periods will be \$15,000 a year, thus making the annual expenditures on original construction become \$140,000 a year. After the expiration of about twelve years the repairs and maintenance to

the works then built will require the service of another working party at about the same annual cost. Perhaps some of the time of the second party could be applied to new works, therefore the time for building the works is estimated at twenty years, with an annual expenditure of \$140,000 a year for the first twelve years and an annual expenditure of \$275,000 a year thereafter until the works are all built, then a reduction of \$150,000 a year for their maintenance. The annual operation and maintenance of the two dredges will be \$83,000, not counting any interest on the investment, this making the total annual expenses connected with improvement by regulation and dredging as varying between \$233,000 and \$355,000 a year.

456

Annual cost of locks and dams.

	Fixed dams, 15-foot lift.	Movable dams, 8-foot lift.
Interest on investment at 2 per cent.	\$70,340	\$169,990
Annual operation and maintenance of the locks and dams.	98,000	192,500
Annual maintenance and operation of the dredge.	43,500	43,500
Total annual cost for locks and dams.	211,840	405,990

Water power worth.—For the reasons as given in the estimates of the cost for improvement above the mouth of Grand River, no revenue from the sale of water power is estimated.

Commercial Worth.

The mouth of Grand River has always been considered as the head of navigation on the Arkansas River, and if there has ever been any commercial navigation of any sort above that point this office has no information of it. The country through which the upper Arkansas River flows is one rich in agricultural and mineral resources. The Tulsa Commercial Club in two letters*—copies herewith—makes estimates aggregating 5,000,000 tons as representing the probable annual tonnage of the river above the mouth of Grand River. However, this is based on shipments to the seaboard. Before such shipments can be made with profit in competition to the existing railway and pipe lines, the Arkansas River below the mouth of Grand River will have to be improved to an extent which will permit of a dependable towboat navigation with tows having a draft of at least 5 feet.

Commercial bodies at Fort Smith and at Muskogee were urged by letter and by personal visit to prepare statistics and set forth the commercial worth of the river between the mouth of Grand River and Fort Smith. In both instances plea of lack of definite information and time was made. However, from conversation with the representatives of these bodies I gathered that they were interested in a radical improvement of the river only as an extension of a similar radical improvement below Fort Smith, and in the case of Muskogee's interest I gathered that a recent adjustment of railway freight rates places the two cities on an equitable basis, and that so long as the river below Fort Smith is in its present unused state Muskogee has no particular interest in the improvement above Fort Smith other than what local aid it would give in the development and settlement of the lands directly on the river. The present actual commerce on the river between Fort Smith and the mouth of Grand River is small, and I could see nothing that indicates that it will increase any in the near future. With an unimproved river below Fort Smith the commerce above will always be of a local nature, and such as now exists is carried on by motor boat of 27 net tons register operating between Fort Smith and Webbers Falls, 61 miles. The freights carried or agricultural products to Fort Smith and general merchandise and farm supplies out of Fort Smith. A little over a year ago Muskogee parties purchased a steamboat of 85 net tons register for the stated purpose of operating it between Fort Smith and Muskogee. The boat

^aNot printed.

457 has made only one trip. In view of the foregoing and in compliance with the law directing that an opinion as to the worthiness of an improvement be expressed, I must report that it is my opinion that the Arkansas River between Tulsa and the mouth of Grand River is not worthy of improvement, and that so long as the river below Fort Smith is not improved to an extent that will give dependable navigable channels there, the river between the mouth of Grand River and Fort Smith is not worthy of improvement beyond the occasional snagging operations provided for in the existing project for the improvement of the Arkansas River.

Very respectfully, your obedient servant,

M. L. WALKER,
Major, Corps of Engineers.

The Chief of Engineers, U. S. Army,
(Through the Division Engineer.)

[First indorsement.]

Office of the Division Engineer,
Western Division,

St. Louis, Mo., June 24, 1909.

Respectfully forwarded to the Chief of Engineers.

I have personally inspected this river in the vicinity of Fort Smith at a time when it was full to about the tops of its natural banks. While I believe that at some future day the conservation and use of its water and the deepening of its channel will be worth paying for, that time seems still quite remote; and I concur with the district engineer in the view that at the present time the Arkansas River is not worthy of improvement by the Federal Government between Tulsa and the mouth of the Grand River, and is worthy only of improvement by snagging between the mouth of the Grand River and Fort Smith.

W. H. BIXBY,
Colonel, Corps of Engineers,
Division Engineer.

[Third indorsement.]

The Board of Engineers for Rivers and Harbors,

Washington, D. C., July 19, 1909.

Respectfully returned to the Chief of Engineers, U. S. Army.

Having considered the accompanying report of the district officer on a preliminary examination of Arkansas River between Fort Smith and Tulsa, the Board has the honor to submit its views and recommendations thereon.

The item of law calling for this preliminary examination of Arkansas River between Fort Smith and Tulsa also requires an estimate of cost, which is submitted in the report of the district officer. The distance covered by the examination is 157 miles. On the upper 65 miles between Tulsa and the mouth of Grand River the slope is reported to 2.06 feet per mile, and the low-water depth 6 inches to 12 inches over shoals. From the mouth of Grand River to the mouth of Canadian River, 37 miles, the slope is 1.22 feet per mile, and the low-water depth over shoals 12 inches to 18 inches. From the mouth of the Canadian River to Fort Smith, 55 miles, the

slope is 1.07 feet per mile, and the low-water depth over shoals 12 inches to 24 inches.

458 For the purposes of estimate the district officer divides the stretch of river under consideration into two sections—Tulsa to the mouth of Grand River, 65 miles, and from the mouth of Grand river to Fort Smith, 92 miles. Referring to the upper section, the district officer states that the excessive slope, small discharge, and shifting character of the bottom render improvement impracticable except by a system of locks and dams, the estimate for which is as follows:

	Lift.	No.	Cost of construction.	Dredge.	Total.	Maintenance.
	Feet.					
Fixed dams	15	9	\$3,631,500	\$150,000	\$3,781,500	\$240,630
Do.	8	17	6,052,000	150,000	6,202,000	350,460
Movable dams	8	17	9,894,000	150,000	10,044,000	541,880

With reference to the lower section, the district officer states that on account of greater discharge and less slope it is deemed feasible to improve this stretch by regulation to a depth of about $2\frac{1}{2}$ feet at ordinary low water, and therefore he submits estimates for improvement by this method as well as by locks and dams, as follows:

Regulation.

Regulation works\$2,933,250
Two dredges 300,000

Total. 3,233,250
Maintenance (after completion) 233,000

Locks and dams.

	Lift.	No.	Cost of construction.	Dredge.	Total.	Maintenance.
	Feet.					
Fixed dams	15	7	\$3,367,000	\$150,000	\$3,517,000	\$211,840
Movable dams	10	11	8,299,500	150,000	8,449,500	435,990

For reasons given, movable dams should be used if the improvement is undertaken. While it may be possible to secure a low-water navigable depth of $2\frac{1}{2}$ feet by regulation in the lower section, this is not deemed advisable, as such a depth is insufficient for carrying anything but light freight, and it would not be suitable for the boats and barges that would be expected to use the slackwater section above. Therefore if the river from Fort Smith to Tulsa is to be improved it should be by a system of locks and dams estimated to cost as follows:

Upper section.....	\$10,044,000	Maintenance.....	\$541,880
Lower section.....	8,499,500	Do.....	405,990
Total.....	18,543,500	Total.....	947,870

There is very little commerce on this part of the Arkansas River at the present time. One motor boat of 27 net tons register is reported as operating between Fort Smith and Webbers Falls, a distance of 61 miles. Prospective commerce is

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459 is purely conjectural and certainly could not be expected to reach any considerable amount until a safe and reliable navigable channel is made available below Fort Smith, so as to permit of through traffic. There is no present probability of any such channel being provided.

Water power to be created by the construction of dams for navigation in this section of river can not be considered of material value, as this territory contains an abundant supply of cheap fuel in the shape of coal, gas, and oil, and the demand for water power would probably not be sufficient to pay for the cost of installing the necessary plant independent of the cost of the locks and dams.

In view of the great cost involved, the small existing commerce, and the improbability of any great increase until the river is improved below, the Board is of opinion, concurring with the district officer and the division engineer, that this section of the Arkansas River is not worthy of improvement by the United States at this time.

Interested parties were notified of the adverse report of the district officer and informed that they might submit statements and arguments to the Board bearing upon the necessity for the

improvement. One communication from the Tulsa Commercial Club^a was received and given consideration.

For the Board:

D. W. LOCKWOOD,
Colonel, Corps of Engineers,
Senior Member of the Board.

^aNot printed.

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460 Government here offered in evidence as Exhibit 60 part of page 601 and page 1731 of report of chief of engineers for 1910. The part from page 601 is the same as the second paragraph of said Exhibit 64, the part from page 1731 reading:

“Commercial statistics (Year ending May 31).

No navigation was reported above Webbers Falls, 430 miles above the mouth and 31 miles below Grand River. Navigation out of Fort Smith was suspended on account of shoal water from August 16 to November 19, 1909; out of Little Rock from August 7 to November 19, 1909; and in the lower river between Pendleton and Rob Roy from October 19 to November 10, 1909.”

Government here offered in evidence as Exhibits 61 from chief of engineers' report for 1911, pages 647 and 648, same being identical with said second paragraph of said Exhibit 64, and the following from page 1882 under heading “Commercial statistics”:

“No navigation was reported above Webbers Falls, 430 miles above the mouth and 31 miles below Grand River.”

Government here offered in evidence as Exhibit 62 from report of chief of engineers for 1912, as follows:

(a) From page 782. “The general project for the improvement covers the navigable portion extending from the mouth of the river to the mouth of Neosho (Grand) River, 461 miles.”

(b) From pages 784 and 785, reading same as second paragraph of Exhibit 64.

(c) From page 2092. "Commercial Statistics, Calendar year, 1911. No navigation was reported above Webbers Falls, 430 miles above the mouth of the river and 31 miles below Neosho (Grand) River."

461 Government here offered in evidence as Exhibit 63 from report of chief of engineers for 1913 as follows:

(a) From page 870. "The general project for the improvement covers the navigable portion extending from the mouth of the river to the mouth of Neosho (Grand) River, 461 miles."

(b) From page 873, reading same as second paragraph of Exhibit 64.

(c) From page 2341. "Commercial statistics, Calendar year 1912. No navigation was reported above Fort Smith (369) or between Arbuckles Island (342) and Lawson Landing (204)."

Government here offered in evidence as Exhibit 64 the following from pages 899 and 2390 of report of chief of engineers for 1914, reading:

"The general project for the improvement covers the navigable portion extending from the mouth of the river to the mouth of Neosho (Grand) River, 461 miles."

"Fort Gibson, on Neosho (Grand) River, 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, is the present head of steamboat navigation. The duration of the navigable periods of the river varies greatly in different years. Occasionally there are periods of very low water when navigation will be suspended throughout the length of the river, and then there will be times when it is possible to maintain a 3 foot navigation through to Fort Gibson all the year. Generally the maximum draft that can be carried at ordinary low water is 3 feet from the mouth of the river to Pendleton (42), 2 feet from Pendleton (42) to Swan Lake (80), 1½ feet from Swan Lake (80) to Webbers Falls (430), and 1 foot from Webbers Falls (430*) to mouth of Neosho (Grand) River

(461). The periods of navigation by steamboats are of about the following averages:

	Months a year for 4 foot draft	Months a year for 2 foot draft
Mouth to Swan Lake (80 miles)	5½	10
Mouth to Little Rock (174 miles)	5	9½
Mouth to Neosho (Grand) River (461 miles)	4	8

The range between extreme high water and extreme low water at Fort Smith, Ark., is 35.5 feet; at Little Rock, Ark., 30 feet; and at the mouth of the river where the stages are controlled by those of the Mississippi, the extreme range is 54 feet."

Government here offered in evidence as Exhibit 65 the following letter:

462 Subject: Irrigation ditches in upper Arkansas Valley.

United States Engineer Office,
823 Center Street,

Little Rock, Ark. April 21, 1898.

Brig. Gen. John M. Wilson,
Chief of Engineers, U. S. A.,
Washington, D. C.

General:

I have the honor to submit the following report on a letter from Smith, T. J., of Bentley, Kansas, January 12, 1898 (file mark 24187):—

That part of the Arkansas River on which the land in question borders, is not now and never was, so far as this office knows, considered navigable. This part of the stream was never gauged prior to the commencement of irrigation, and no absolute comparison of the flow of water now can be made with that prior to the commencement of irrigation. Practically all the data that is available in the shape of gauge and rainfall records and discharges for the lower river is for the period subsequent to the commencement of irrigation, consequently this discussion is of necessity incomplete. From my investigation, however, it can, in my opinion, be assumed that most of the water coming from the Rocky Mountains into the Arkansas River, except at flood times, is used in irrigation and that the increased demand for water will cause the re-use of the water returned to the channel by seepage, again and

and again, until it is practically all consumed in plant life and evaporation.

If practically all the water flowing in the upper Arkansas at such times of the year that a diminuation of the water supply would be detrimental to navigation, was lost in the sands of the great plains and did not reach the lower and
463 navigable portion in quantity sufficient to influence navigation before irrigation was commenced, the question as to its distribution now and as to the deterioration of property due to the present method of distribution, in my opinion, belongs to another Department of the Government. The lack of data is felt in discussing the question as to whether or not the water supply in the navigable portion of the Arkansas River has been diminished by irrigation works in the upper part of the stream.

“Roughly speaking, the first irrigation ditches in the Arkansas Valley were constructed about 1860; the larger ditches from 1888 up to 1893. There is now but very little new construction, but more use of the water inasmuch as more land is being brought under cultivation. One ditch has been increased during the last year”. (Prof. L. G. Carpenter, State Agricultural College, Colorado.)

The effect of irrigation, if any, should be shown during the last ten years. A chart is enclosed herewith showing:—

1st. The mean monthly stages of the Arkansas River at Little Rock, Arkansas from 1872 to 1896, inclusive. No records are obtainable prior to 1872, so far as I know.

2nd. The total monthly and yearly rainfall at those points where the rainfall seems to effect the stage of the Arkansas River. This rainfall record is incomplete prior to the present stage of development of irrigation in upper Arkansas River.

For comparing the average stage of such a river as the Arkansas for a certain term of years with its average stage for another term, gauge records are of great value, but for discussing the varying navigable capacity of such a stream at low water for a period extending over many years, gauge records are of very little value. The only reliable comparison
464 being the absolute discharges at the time of the various low waters. For instance, in November, 1887, the Arkansas State Geological Survey gauged the Arkansas River near Little Rock at a stage of 1.2' (.1' above the lowest water of the season) and found the discharge to be 2639 cubic feet per second. In 1894 the discharge at 2.4' (.1' above the

lowest water of the season) on same gauge was found to be 2597 cubic feet per second, and in 1897 gauge 1.2' (.1' above the lowest water of the season) the discharge was found to be 1190 cubic feet per second. A comparison of the discharge of 1887 and 1897 with the same gauge reading shows the uselessness of gauge readings in comparing low water discharge in a river like the Arkansas.

In 1892 the lowest gauge reading of the season was 5.4 feet, the reported available depth for navigation between Little Rock and Pine Bluff was 18". In 1894, the lowest gauge reading was 2.3 feet, the reported available depth for navigation in the same reach of river was practically the same as in 1892.

Hence it is seen that we have little data, other than the few recorded low water discharges and the recorded difficulties that certain steamboats have had, from which to deduce a conclusion as to the diminution of the low water supply.

At Napoleon (the mouth of Arkansas River) the discharge was 2318 cubic feet per second on November 4, 1858. If this low water was subject to the rate of decrease observed between Pine Bluff and Little Rock in 1894, the low water at Little Rock that year (1858) would have been about 1090 cubic feet per second. If subject to the same rate of decrease as observed between Pendleton's and Little Rock in 1897, the low water at Little Rock for 1858 would have been about 1580 cubic foot per second. This measurement was made by Humphrey and Abbott; no statement is made as to whether or not any water was running into White River, via the White River cut-off. This adds some doubt as to its value in this discussion.

465 In 1879 a series of discharge observations were made at Pine Bluff. The series did not cover the low water season, but at a stage of 1.45' above the low water of that year a discharge of 3822 cubic feet per second was obtained. The discharge curve prolonged downward gives a discharge of near 1900 cubic feet per second. The increase in discharge between Pine Bluff and Little Rock at Low water is from 300 to 500 feet per second; this would make the Little Rock 1879 low water discharge between 1400 and 1600 cubic feet per second. A low water discharge deduced from a discharge taken at a higher stage in a river like the Arkansas is very unreliable, since a possible lowering of the crossing below may be the cause of the lower gauge reading, the discharge changing but little.

Discharge at Little Rock, December 6, 1886, when river was at a stage 0.8 feet above low water of that year, was 4365 cubic feet per second. The discharge curve prolonged downward to the low water of that year gives near 2500 cubic feet per second as low water discharge.

In 1887 and 1888, thirty two discharge observations were made at Little Rock by the Arkansas State Geological Survey. One of these was taken when the river was within 0.1' of the low water of 1887 and gave a discharge of 2639 cubic feet per second.

During the low water season of 1894, when the river was 0.1' above low water of that year, discharge observations were taken at Little Maumelle (10 miles above Little Rock) and at Pine Bluff. The discharge at Little Maumelle was 2597 cubic feet and at Pine Bluff, 3166 cubic feet per second. The total increase between Little Maumelle and Pine Bluff was 569 cubic feet per second.

466 In October 1897, when the river was at its lowest stage for that year, discharge observations were made at Belcher's Ferry (8 miles above Little Rock) and Pendleton's. The discharge at Belcher's Ferry was 1190 cubic feet per second, and at Pendleton's 1775 cubic feet per second. The total increase from Belcher's Ferry to Pendleton's being 585 cubic feet per second.

The estimated low water discharge at Little Rock in 1858 has been previously given as being between 1890 and 1580 cubic feet per second. (Humphrey and Abbot at Napoleon) The observed low water discharge of 1897 falling between these values does not confirm the statement that the low water discharge is decreasing. Such discharges are very unusual. An examination of the rain chart shows an unusually small rainfall in the autumn months of 1897. 1897 is the only year since 1893 (the year in which irrigation reached its present stage) that anything unusual in the low water discharge has been noticed.

Examining the records of depths in navigable channel, there is nothing shown warranting the statement that they are decreasing.

Hempstead's Pictorial History of Arkansas, extracting from Journal of Father Pierre Francois de Charlevoix of an exploration in 1721, says, "one goes up the river of the Arkansas with difficulty . . . and in many places the waters are often so low that there is a necessity to tow the pettiagraus." This history extracting from Journal of Travel by

Thomas Nutall, says, "Nearly opposing Vache Grass Creek we passed the rapids over which there is scarcely more than 12 inches of water at the lowest stage." The point referred to is some 11 or 12 miles below Van Buren, Arkansas, and it was in April 1819 that Mr. Nutall passed this place. In extracting from a description of a trip by D. T. Witter from St. Louis, Missouri, to Little Rock, Arkansas in 1819, this same

history states, "25 of Dec., arrived at Arkansas Post. 467 Finding the water too low to proceed any further till a rise in the river, we were compelled to wait there several days." Mr. Witter made this trip on a "Keel boat." The size and draft of it is not stated, but as this class of boats were cordelled and poled upstream, it could not have been of large size or deep draft.

Humphrey and Abbott in their report of the Mississippi River, published in 1861, regarding the Arkansas River, state (page 31, 1876 reprint), "The depth of the Arkansas varies greatly in different parts of its course. Throughout the prairie region, it averages about 2 or 3 feet, exclusive of shoals, but there are seasons when the water entirely disappears . . . In the navigable part of the river, the least depth found upon the bars in extreme low water, from the mouth to Post of Arkansas, is from 2.5 to 3.0 feet; thence to Little Rock, 2 feet; thence to Fort Gibson, 1 foot." The Arkansas River at Hutchinson, Kansas on May 13, 1895 had a discharge of 10 cubic feet per second, and daily discharges from July 1, 1895 to January 1, 1897 show 16 cubic feet per second as the lowest discharge in that period; this small discharge was from August 31, 1896 to September 15, 1896. Whether or not this part of the river is included in the portion of the river mentioned by Humphrey and Abbott as being a part where the water at times entirely disappears, I do not know. Humphrey and Abbott probably obtained their information regarding the upper portions of the river from report of exploration made in 1806 by Lieut. Jas. B. Wilkinson and from report of Capt. Bell, who led a detachment of Maj. Long's down the left bank of the Arkansas to Fort Smith in 1820.

In 1869 S. T. Abert made a survey of the Arkansas River from Fort Gibson to Little Rock. During the time covered by the survey there was no very low water. His original 468 map of the Beaver Dam Beach, 27 miles above Little Rock, bears this note:—"15 inches in low water" and in his report, says: "Below Little Rock, the low water sometimes occurs in January, and it is stated that in 1853, a boat bearing government stores and destined for Fort Smith was obliged to lay up for an entire season in the lower

part of the river. The stores were reshipped on barges drawing from twelve to fifteen inches of water." Abert also states that the river cannot be navigated above the mouth of Verdigris River.

In Annual Report of Chief of Engineers for 1888 on page 1398 in this, referring to the river below Little Rock: "Captain Taber states that navigation becomes difficult at a $3\frac{1}{2}$ foot stage when there is about $2\frac{1}{2}$ feet on the shoalest bars, and that the least depth on these bars is 12 to 14 inches."

Annual Report Chief of Engineers, for 1894 on page 1540 gives a report on the early navigation of the Arkansas river from which an idea may be formed regarding the channel depths during some of the low-water seasons; from this report, I arrange the following:

- In 1855 During this year there were eight months in which only one steamboat was landed at Little Rock. This was a small stern-wheeler named the "Red River", drawing about 12 inches of water.
- In 1860 The steamer "Sam Kirkman" drawing $4\frac{1}{2}$ feet, entered the Arkansas River in January, and, although she took advantage of every rise, did not reach Fort Smith until May.
- In 1861 For three months there was not over 12 inches of water over Dardanelle shoal.
- In 1862 The water was so low that boats drawing 12 inches could not go from Little Rock wharf above the point where Baring Cross Bridge now stands, Just below Little Rock, the river was divided into many small channels with not over 10 or 12 inches.
- In Jan. '68 The "Silas Wright," a very small steamboat, could not pass over Moore's Rocks.

To this can be added a statement lately made by Captain (Steamboat) Ed Huston. In is this:—The 'Frontier City' came out in 1860, she drew 11 inches light and on her first trip, loaded to 2 feet, she could not get above Arkansas Post, 35 miles above the mouth." Ed Huston began his river service on the Arkansas in 1856 as "Keel boatman. He states that as a rule there never has been any steamboat navigation above Little Rock for about 3 months each year and that there have been times that it was necessary to lighten Keel boats" over the shoals. Keel boats were used during all low water seasons until the Little Rock and Fort Smith road was built.

The statements of channel depths covering a period of over 150 years do not show that these depths are decreasing.

Gauge records of the stages of the Arkansas River cover a sort period of time, only $25\frac{1}{2}$ years. During this time the lowest gauge reading was that of 1879, which corresponds with 0.55 on the Weather Bureau Gauge now in use at Little Rock, 1881 with a low water stage of 0.7 is next; 1880 with a low water stage of 0.9 follows: then comes 1897 and 1887 with stages of 1.0 and 1.1 respectively. Taking the yearly averages of gauge readings, 1887 with an average of 4.3 feet is the smallest; this is followed by 1879, 1880, 1886 and 1895 with yearly averages of 4.4 feet, 4.7 feet, 6.2 feet and 6.4 feet respectively. By grouping the gauge records into periods of five years and omitting the year 1879, when the record is not complete, the following is obtained:

1872 to 1876	Both inclusive (5 years)	Average stage	7.76
1877 to 1882	“ “	“	6.82
1883 to 1887	“ “	“	8.22
1888 to 1892	“ “	“	9.14
1892 to 1897	“ “	“	7.16

By taking the average stage for the first twelve years of the period covered by gauge records and the last twelve, the average for the first is found to be 7.73 feet and for the last 7/67 feet, a difference of 0.06 feet. This comparison of gauge readings does not show that the river stages are getting lower.

Rainfall records for points in the Arkansas Valley do not cover any great length of time. The record at Dodge City, Kansas, begins in 1874 and continues up to date. Little Rock record begins in 1879, Fort Smith records prior to June, 1882 are not obtainable here. Humphrey and Abbott mention a record for Fort Smith beginning in 1840 and give the mean annual rainfall at that place as 41 inches for the $19\frac{1}{2}$ years preceding 1860. The mean rainfall there for the 15 years preceding 1898 is 43.7 inches. Rainfalls at Wichita and points farther up the valley do not appear to have any marked effect on the river at Little Rock unless accompanied by rains at points lower down, while rainfalls in the verdigris and Grand (Neosho) River Valleys have decided effects, and the quantity of water carried past Little Rock appears to depend almost entirely upon the amount of rain falling east and southeast of Wichita. Taking the rainfall at Independence (Kansas), Springfield (Missouri) Fort Smith (Arkansas) and Little Rock (Arkansas) as being the

ones having the greatest effect on the river at Little Rock, and using the sum of their rainfalls for the months of September, October, and November, the following tabulation is made:

Autumn Rain	Discharge at Little Rock	Year
33.27	2639 cu ft. per sec/	1887
37.29	2597 " " "	1894
17.68	1190 " " "	1897

Dardanelle and South McAlester rainfall should be considered in this connection but the records do not cover the period.

No constant diminution of the water supply in the navigable part of the Arkansas River is shown by the records so far as I can see. Tradition and history seems to establish the fact that the navigable depth of the Arkansas River was as small at times prior to 1860 as it has been since. There is nothing in the records of the last 20 years to show that these periods of extreme low water are or more frequent occurrence since 1888 than in the ten years prior to 1888.

In support of the claim that the water supply has been diminished it should be stated that

The Arkansas River at the point where it immerses from the mountains is naturally a perennial stream and continues so far some distance into the plains, where its volume is greatly reduced by absorption in the sands and sometimes entirely disappears. This is the natural condition of many other streams flowing from the Rocky Mountains. Under the present condition, all the water, excepting that in floods, coming down the Arkansas and tributaries in eastern Colorado, is taken out of the streams by irrigation ditches. The waste and seepage water of the upper ditches is caught and used by others farther down the stream. This continues as far down the stream as a perennial supply (either surface or shall underflow) is obtainable. This, of course, prevents the natural flow of the water down the old bed of the Arkansas. Under the natural condition existing before irrigation was begun, the sandy bed of the Arkansas was fully and continually saturated with water to some point quite a distance from the eastern foot of the mountains. Over this saturated bed, the late spring and summer floods could and probably did flow without great loss in volume, and extended the surface-flowing stream still farther down the valley, probably beyond the absorbent bed; to points where the stream is now perennial; and at that time it was a rare occurrence for the water to entirely disappear over the many

miles of bed that is now generally dry during the late summer, autumn and early winter months. This rarity of entire disappearance is implied in the Humphrey and Abbott statement—there are seasons when the water entirely disappears—Mr. T. J. Smith stated to me that he saw the river dry at or near Bentley, Kansas, once early in the 70s and when he told new settlers of it they appeared to doubt his statement/ He also stated that now it is an exceptional case when the river remains a surface-flowing stream all the year. These statements of Mr. Smith, which are confirmed by other inhabitants of that section, would indicate that the amount of water passing down the Arkansas River, near Bentley, Kans., is not as large now as it was in the early days.

Many measurements of the volume of flow in the Arkansas River in eastern Colorado have been made lately. The minimum discharge observed at Pueblo in 1895 and 1896 was 203 cubic feet per second, August 18, 1896. The maximum discharge was 16500 cubic feet per second on the night of August 19, 1896. The discharge at Canon City, Colorado (not many miles above Pueblo) was 144 cubic feet per second on August 16, 1896.

The Eighth Biennial Report of the State Engineer to the Governor of Colorado" on page 83 gives a tabulation showing, with other information, the number of miles of ditches and the average amount of water carried in them in what is known there as "Water Division No. 2, Arkansas Division". I understand this district includes all ditches taking water from the Arkansas River and its tributaries in Colorado.

The total length of the ditches is given as 2,444.35 miles
472 in 1895, and the total average amount of water carried during the season of 1895 was 5,637.02 cubic feet per second. In a similar table on page 106 of the same report, the total number of miles of ditches for 1896 is given as 2,495.15, and the average amount of water carried as 4,439/11 cubic feet per second. There is enclosed herewith a tabulation showing number and name of ditches that obtain water from the Arkansas River and its tributaries; also date of priority and quantity of water decreed to each of them in Colorado. I have not been able to obtain information regarding those in Kansas.

As to the final disposition of the water that came out of the mountains in the early days which was absorbed in the sandy plains, I have no information to present. Where it came to the surface again, if ever, I have no way of learning. It may have followed the Arkansas Valley down as an underflow un-

til forced to the surface by some under ground impervious ridge and made its appearance in springs, and the gradual diminution of these springs may not as yet be noticed.

Summing up the records and testimony, I cannot state definitely that irrigation has decreased the navigable capacity of the Arkansas River, but it does appear that the length of the bed, in the upper and unnavigable portion from which the water entirely disappears, has been increased and that these periods are of more frequent occurrence/

Very respectfully,

Your obedient servant,

WM. L. SIBERT,

Captain of Engineers/

2 enclosures.

473 W. L. SIBERT, witness for plaintiff, by a deposition taken on the 3rd day of December, 1915 before Alexander Gault, notary public, District of Columbia, testified:

Direct Examination.

Name, William L. Sibert, 55 years old, post office address San Francisco, Ft. Riley, California, Brigadier General, United States Army, in command of coast artillery on Pacific Coast, was officer in Engineer Corps of United States Army until last March, for 30 years, for 2 years was assistant to General Poe in connection with construction of lock at Sault Ste. Marie, and 20 and 21 channel work in connecting waters of Great Lakes, for 4 years was on duty in Kentucky in local charge of improvements on Green and Barren and other rivers, for 4 years was stationed at Little Rock, Arkansas in charge of improvement of Arkansas and other rivers, for 5 or 6 years in Pittsburg in charge of construction of locks and dams on Ohio, Alleghany and Monongehelah and other rivers, for 7 years was on the Panama Canal as member of Isthmian Canal Commission, having charge of construction of Gatun locks and dams, about seven miles of canal from Gatun to the sea; and for a few months in charge of the work on the Ohio River.

From 1894 to 1899, as officer in charge of engineer office at Little Rock, had supervision of Arkansas River and had opportunity and took occasion to observe character of the Arkansas with reference to its navigability at that time and was then generally familiar with previous examinations and re-

ports made by engineer officers of the upper Arkansas at that time. P. R. Van Frank, Jr., was his principal assistant, said Van Frank being considered by witness capable to fill position of principal assistant engineer, witness finding him to be a good man, a competent engineer for that character of work.

Witness had occasion to acquire data with reference to navigability of the Arkansas, as to the point at which navigability would cease and as to attempts at navigation of the upper Arkansas. Witness while in service at Little Rock found no data showing any movement of commerce on the Arkansas above the mouth of the Grand as recorded in the commercial statistics and never knew of any practical use of the Arkansas River for navigation purposes above the mouth of the Grand which was considered as the head of navigation by steamboat operators generally and by practically all of the Government engineers and assistants with whom witness came in contact. Witness at no time came in contact with any records of any commerce above the mouth of the Grand, although witness had heard and knew that one of two boats had in time past gone up there, but there was no commerce on the river. It could not be practically used for commerce.

Witness stated he had looked over the report made by Major M. L. Walker in 1909, contained in House Document No. 206, 61st Congress, 2nd Session. The statements as to physical characteristics of the stretch of river from Tulsa to the mouth of the Grand River, as stated on pages 2 and 3 of said report corresponded with the recollection of witness of the physical conditions there. Witness could not state as to the relative discharges, but he had the impression from his investigations that more water came out of the Grand River than out of the Arkansas where the Grand entered the Arkansas, but the relative amount out of each witness did not know.

Assuming that the bed of the Arkansas consisted of shifting sands, making the channel one of uncertain position, that the width between banks for 65 miles above the Grand varies from 300 to 750 feet, the 750 feet being in the part of this section, the average being 1870 feet, that the fall in this section is 134 feet or an average of 2.06 feet per mile, that the height of the banks averages in this section from 14 to 22 feet, the witness testified that it would require at least 3000 cubic feet per second to make an open channel of width and depth sufficient to economically or practically transport commerce. The fall of 2 feet per mile would give

a very swift current in the channel, being a greater fall than is generally encountered in rivers where open channel work is contemplated or done generally.

The witness said that in making the statement as to the necessity of the 3000 cubic feet per second, he referred to what is generally termed improving the river by regulating its channel regulating its width and its shape in such a way as to produce the best depth that one can get with the flow of water available, which system is in contra-distinction to the slack water system or lock and dam system.

Witness further testified that when serving in Little Rock, he found that the rises in the Arkansas were of short duration and could not be relied upon to occur at stated times during the year, that is at expected times, that he had no definite information as to the flood discharge in upper river, but that at Little Rock the flood discharge was quite large. A river that has a very large high water discharge and a very low water discharge is difficult to regulate or control by the regulation system of improvement; the thread of the current during high water does not follow the same line that it does during low water, attacking the works of contraction and of regulation and making their maintenance difficult; it also fills up the crossing during high water and during the transition stage from high to low; navigation is exceedingly difficult in a river of character described.

Witness testified that he did not like to answer the question in inches or feet as to the channel depth that would be afforded, in his opinion, by 3000 cubic feet per second and ordinary regulation works in the section referred to above Grand River, but that was a question susceptible of direct calculation. Assuming a slope and a width of channel and a certain amount of water one can calculate exactly the depth
 476 but that you could not predict a certain depth with the same certainty in a stream of this sort like the Arkansas as you could predict in one of permanent banks and bottoms. The entire Arkansas River has a bed composed of shifting sands and gravel, making the position of the deepest water uncertain. The channel changes from one side of the river to the other and a boat may come up the river this week and not follow on her return trip the same channels in a great many parts of the river that she followed going up, changes coming very rapidly, this being especially true at the crossings, the crossings being the part of the river that connect the bends. You come down the river say with a bend to the right;

the next bend below will be on the left; in crossing from one bank to the other following the bends is known as the crossing. The crossing is always the shallower part and where the greatest difficulties of navigation are encountered.

In response to the question, "What is your opinion, assuming the facts as before stated, as to the feasibility of a system of locks and dams in the Arkansas River above the mouth of the Grand?", the witness answered, "If rock foundation is available for the erection of such structures they could of course be erected and probably maintained. If rock foundation was not available it would be quite a difficult matter to maintain such structures." It is only a question of money as depth you go and witness thought the rock should not be more than 20 feet below the bottom in order to justify going to it in a structure. Witness thought if the Arkansas River was improved by fixed dams, he would expect the pools to fill up with the moving sand. If movable dams were built, there would be considerable filling in the pools that might be kept open by dredging; that he thought that it would be a continual source of expense getting to and from any locks built in
477 the part of the Arkansas above the Grand.

Witness did not recommend a system of locks and dams as a feasible method of providing a channel for useful navigation above the mouth of the Grand and he did not believe it would afford a reliable route of transportation when completed. The amount of water, at low water, at that part of the Arkansas was quite small; with the banks on an average of 1,870 feet apart, the evaporation would be largely increased during the low water season and the seepage of water through the sand would be a great deal more than with the slack water system on account of the large additional surface in contact with water; that the effect of the short duration of floods and uncertainty as to the date of their arrival upon any scheme not contemplating the establishment of a channel at low water would simply mean that any possible navigation would be confined to the times of the floods. Unless an attempt was made to create a navigable depth at low water, the time that the stream could be used would be so short and so uncertain that commerce could not depend upon it and without a channel for ordinary water the river would be practically valueless for commercial purposes.

Witness had never seen any report made by an engineer officer or board of engineer officers examination of river which placed the head of navigation higher up on the Arkansas than the mouth of Grand River; that the term "head of navi-

gation" he understood to mean the height at which practical navigation ceases.

Cross-Examination

By "practical navigation", is meant the navigation that can be relied upon to the extent to justify or cause its use by the people in the transportation of products. Work has had to be done nearly every year for the last 30 years on the Arkansas River for developing what might be termed local use of the stream. A systematic improvement was started but
478 stopped.

There are a great many rivers in the United States for which Congress makes annual appropriations and which require annual expenditures of money in order to make them available for navigation.

Witness did not know of his own knowledge the variation between high water mark and low water mark above the Grand up to Wichita, Kansas. The report of Colonel Walker shows the range between high and low water mark to be 16.9 feet.

Witness, when asked about the Trinity River in Texas, stated that he had never seen it and knew little about it; that he did not know that the difference between high water mark and the low water mark on the Trinity River at Dallas, Texas is 35 feet, that of course being a matter of record. Witness knew that the Government is putting in a system of locks and dams on the Trinity in Texas, but he did not know of his own knowledge that the difference between high water mark and low water mark is greater on the Trinity than it is on the Arkansas, and that he knew nothing about the physical characteristics of the Trinity River.

Witness was acquainted with the Missouri River above Kansas City; he always classed the two streams alike, but that the Missouri River has many times more water in it than the Arkansas; that the Missouri has been held navigable and has been navigated up into Montana; that the project of the Government he had charge of when he was in Little Rock contemplated the improvement of the Arkansas River from its mouth to Wichita, Kansas by regulating the channel so as to give a low water depth of 6 feet from Little Rock out and of 2 feet from there up. It was a matter of record.

Appendix Q of the annual report of the Chief of Engineers for 1896 being placed before the witness, witness stated that that report was made by him and that the general head started

479 "Removing obstructions in the Arkansas River, Arkansas to Kansas", but that it was an extract from the annual report of the Chief of Engineers to the Sec. of War. Witness further testified that on page 1649 under the heading of U-1 of said report there appeared the heading "Removing obstructions in the Arkansas River, Arkansas to Kansas". This was the heading in his report. The other reference was in the Chief of Engineers' report on the same subject. In said report of 1896 the following statement,—“Present approved project. To remove rock and gravel reefs by blasting and dredging, to contract the channel by dikes or dams, permeable or solid, of such construction as the local conditions require, and to hold the channel so obtained by revetment where necessary, from Wichita, Kansas, to the mouth, the object being to secure a channel not less than 6 feet in depth from Little Rock to the Mississippi River via White River, cut-off, and not less than 2 feet in depth above Little Rock, Arkansas”,—was made, as the present approved project at the time his said report was made. Said project had been adopted by Congress in 1888.

In response to question as to what was the general reputation of Captain H. S. Taber among army officers and engineers, as an engineer, witness answered that said general reputation was not a very good one. Captain Taber served a number of years and had been dead about 20 years. Witness found his report in the Little Rock office and thought he read the recommendation of Captain Taber, or rather his estimate as to the cost of rendering the Arkansas navigable from Wichita, Kansas to the mouth.

In response to the question as to whether or not there is a difference of opinion as a rule as to the feasibility or non-feasibility of the navigation of different rivers among engineers, the witness answered in the affirmative.

Witness said he had never personally gone over all of the Arkansas from the mouth of the Grand to Wichita, Kansas, but he had gone over parts of it and he did not remember the distance from Wichita to the mouth of the Grand.

480 Witness testified he was acquainted with the Susquehanna and that his general impression was that part of said river is navigable in Pennsylvania and part is navigable in Maryland and between these two navigable portions there is a part that cannot be navigated. Such a thing is possible.

Witness testified that all the time he was in charge of the Little Rock office the project under which he was working contemplated the navigation of the Arkansas for rendering it open to navigation from Wichita, Kansas to its mouth.

Witness knew Thomas H. Handbury, an officer in the Corps of Engineers; his reputation as an engineer was good; he was a good, safe man. In Appendix Q, page 1573, to the Annual Report of the Chief of Engineers for 1882, the following, written by Major Handbury, occurs:

"As resources of the country through which the Arkansas River flows are developed the greater is the necessity for its improvement and in order to insure cheap transportation to market for the products.

"This is Nature's outlet for the surplus products of a large portion of Western Kansas, Indian Territory, and the State of Arkansas.

"The coal interests on the borders of this river in the Indian Territory and Arkansas, which are just now beginning to attract attention, to say nothing of other products, such as cotton, grain, lumber, etc., will soon demand its extensive and permanent improvement.

"The removal of snags and other obstructions of like character are of course very beneficial to navigation and very necessary, but under existing circumstances it can afford only temporary relief, which must be continued from year to year until some radical improvement is effected.

"The time as now come when it would be advisable to take in hand the subject of the permanent improvement of the Arkansas River throughout its navigable extent from Wichita, Kansas, to its mouth.

481 Witness testified that he had never been on the Red River and had never read about it especially.

Witness further testified that, under his construction of the acts of Congress making appropriations for the improvement of the Arkansas River from Wichita, Kansas, to its mouth, he had the right, under the law, to make a project for the expenditure of the money in any part of the Arkansas River covered by the project, which was from the mouth to Wichita, Kansas.

The navigation of the Arkansas at Little Rock, Arkansas and Ft. Smith, Arkansas, is sometimes difficult and impossible for a while.

On account of the transportation facilities afforded by the railroads for a number of years past, the volume of river navigation upon the navigable waters of the United States has been constantly on the decrease; that there has been a material reduction in navigation on the Missouri River between St. Louis and Kansas City.

Witness further testified that, in his opinion, if the canal could be made with a concrete bottom and sides and you filtered the water into it, the Arkansas could be navigated, but he would prefer to make the canal on the bank.

Witness further testified that he thought it had been the policy of the War Department in the last 30 years to liberally apply the power given for Federal control over navigable rivers.

Redirect Examination.

Before the witness was in charge at Little Rock, he thought there was some attempt to do some snagging above the mouth of the Grand. Captain Evans was in command of the snag boat.

482 Government here offered in evidence the testimony of EDWARD HOUSTON, found on page 1300 et seq. of record in case of Kansas vs. Colorado, and reading:

"I am sixty-five years of age, and reside at Little Rock, Arkansas. I have resided here about forty years. Sometimes I have been away for six months or a year or so. At one time I was engaged in boating—keel and steam-boating. At the present time I am engaged in steamboating on the Arkansas River. I have been engaged in that business since 1855 between the mouth of the Arkansas River and Fort Gibson. When I first came here Fort Gibson was considered to be the head of navigation. I was at Fort Gibson in a snag boat about ten years ago, and then I was there on a freight boat about five years ago. I have observed the flow and volume of the river ever since I have been acquainted with it.

In regard to whether there is any less water in the Arkansas River now between the mouth of the river and Fort Gibson, I will have to explain a little about that. The Arkansas River, with my experience on it, there are odd years, probably for five or ten years it might be very bad, and then the next five or ten years it might be very good. But the river is just exactly, as near as I can tell, except in certain places, it is changed about, as when I came here. Just the same exactly. There is one extreme—one way or the other—but as far as the river and

the channel of the river, it is just exactly the same. Yes, there are times through a year or series of years when there is less water than the year before. There is an extreme average of about five years. I think the river would be navigable now just the same as before the war, but the business don't justify it, and they haven't got the boats to navigate it. Yes, if the conditions were the same as they were when I first came here it would pay just the same to navigate it now as it did then, and they would not have any more difficulty in navigating it. If they could get paid for the same goods today as formerly we would still navigate it profitably, but the competition and railroad rates competing on both sides has caused on business and nobody attempts it. I believe boats do run up as far as Fort Gibson at the present time. They had been when I went up there five or six years ago. It may now be cut off; I don't know. I have seen years here before the war there wasn't a boat came to the landing for nine months. I haven't seen it since the war but what there has been some kind of a craft in the way of a steamboat. There appears to be more drouth down in this lower end of the river than there was before the war. The planters complain more of it. But it has not diminished the flow of the river any.

I have heard the expression "the June rise"? We still have the June rise in the river. This rise gets its supply from the spring rains. As to whether or not any of the June rise came from the snow in the mountains of Colorado, I will explain that. In 1858 the man that I learned the river under—the people contended down here that it came from the snow—the overflow—and some from the water. He went up there personally and experienced it and watched it and came back and reported that it came from the spring rains. That is all I know about it. He was a very reliable man, and that is what he discovered, that it didn't come from the snow. He said it came principally from the spring floods. This is all hearsay with me. He went up and explored that. The gentleman who made this report is not now living.

Cross-Examination on behalf of complainant,

By Mr. Ashbaugh:

No sir the river never goes dry in these later years between Little Rock and Pine Bluff. There are times in the year, sometimes when you can't navigate it. I expect about half of the time between here and Pine Bluff the river is not navigable. Ever since the war it has been in about that condition, that about six months of the year it is not navigable between here and Pine Bluff. In those early days they did nav-

igate it longer, on account of the boats. They had different boats that they could navigate it with.

Q. With the same boats, however, could they navigate it as many months of the year now as they could during the early years that you knew it?

A. Do you mean, to take the same boats they could navigate it as well as they did before the war?

Q. Yes, that is what I mean. A. Well, they could not.

Q. They could not?

A. No sir, the boats are different boats.

Mr. Campbell: He says, taking the same boats they had before the war could they navigate the same?

484 The Witness: Yes, they could navigate the same.

Q. Could they navigate it as long each year with the same kind of boats that you then used as you could in those years? A. Yes sir.

I could not tell what the flow of the river is here. The river from the mouth to here is narrower than it is from here to Fort Smith. I don't know how wide it is at Little Rock. When I first came here it was a third less right here. No, it is not wider now than it used to be here, to take the general average of it. No, sir, it is not narrower than it used to be; it is just the same. As to how deep it is on an average, well we never averaged it. I couldn't answer that question at all. I [cannot] answer as to how deep it is on an average excluding floods. During periods of low water I don't know anything about how deep the river is on an average at Little Rock. I don't know anything about the average of these pools. Now, sometimes from here to Fort Smith a bad bar will be right where it was deep, probably eight or ten feet, [and] year before. There will be eighteen inches of a flow over that bar wheere there was six or eight feet the year before. Whenever we started out here in low water we would generally find that all the way to Fort Smith there was from three to five bars, you might say, and where we would find a bar that year it probably was not within fifty miles of where we found it the year before. There is no bar here at Little Rock. Nobody pays any attention to the depth of the water at Little Rock. They pay their attention to the bars. I didn't pay any attention to this river in front of Little Rock at all. That is impossible to do. Because I know there was water enough for a boat to go. There is a shallow river here at Little Rock. I have known it to be down at some seasons

to ten inches. Some of it as low as eight inches to two feet, etc. Now, one of those years might be five feet the year round and it might be thirty inches or three feet the year around; then the next five years it might be a continuous flow of water of eighteen to twenty inches. I would not say that the river averaged during the dry season three feet.

484a The first big stream of importance between Little Rock and Fort Gibson is the Porteau. Then there is the Cacha creek, the San Boy, the Sallasaw and the Canadian River. These all flow in below Fort Gibson. These streams do not all flow the year round; that is, not to amount to anything. They get dry sometimes. The grant river flows all the year round. The Candian does not flow all the year round to amount to anything. I was up to Fort Gibson about five years ago. I think I have been up to Fort Gibson during the last ten years only two or three times. I don't know what proportion of the river as it flows past Little Rock is supplied by the river as it goes through Kansas. The big spring rises come from above Fort Gibson, and they come regularly in these later years,—as regularly as they used to. I couldn't tell how many streams rise in Kansas and flow into the Arkansas. I am not posted on that. The Grand River rises up in Missouri and flows into the Arkansas river at Fort Gibson. I think the Grand River has maintained its usual flow during the later years just the same. I was never on the Verdigris River and don't know anything about the Walnut or the Ninneseah nor the Little Arkansas. I know nothing about the Arkansas except three miles above the mouth of the Grand at Fort Gibson. That is as far up the Arkansas river as I ever saw it. From my own experience I don't know anything about whether the Arkansas above the mouth of the Grand is as large now as it used to be.

Recross Examination on behalf of defendants,

By Mr. Dawson:

When I first began to run on the Arkansas river there was not a railroad in this part of the country and the means of transportation for freight were confined to carrying it in boats or else hauling it overland, and the river furnished the cheaper method of transportation. The amount of boating on the river in late years has fallen off ninety per cent; and that is not on account of any change in the river between Fort Gibson and its mouth. It is the competition of the railroads on both sides of the river that don't justify the people to navi-

gate it. The steamboats that we used to run on the
485 river in the early days drew from nine to twelve and
a half inches, and the keel boats drew only three inches.
With the same character of boats today as we had before the
war, the same navigation could be carried on along the river,
and the reason they cannot now run up to Fort Gibson as easily
is that they don't run a boat as well adapted for it. They
have not got the boats. The simple reason is that the rail-
roads have run them out of the business. The navigation on
the stream is limited by the depth of the water on the bars
or in the shallowest places, and those places change and shift
from month to month. And that has always been true. The
channel of the river occupied by the flowing water here at Lit-
tle Rock in the last forty years is wider than it used to be.
This has no effect at all except in the overflow immediately at
this place, because it is wider. In 1866 I think we had that
overflow. I have a mark down here. It went into the side
door of that old warehouse, and it didn't go there this last
overflow by eighteen inches or two feet. Well, now, eighteen
miles down the river, mind you, this water overflowed in 1844.
It overflowed more down below than it did in the earlier flood,
because the river widened out here, and where the water used
to come in here in 1866 this bank has been cut away and it
has reduced the flow of water here, and where they had this
low overflow here in 1844 it raised it higher there because the
river is narrowed up there. In other words, the river widened
in some places and narrowed in others, but you can ['aken] an
average from here to Fort Gibson and to me, I can't see a
bit of difference in the width or depth or flow of the river. I
think we had the longest period of low water in 1861. I don't
think there has been any year in the last fifteen years that
equalled 1861 in the lowness of the water and the length of
time it lasted. When I got down to the mouth of the Grand
river on the Arkansas in 1858 there was no water coming
down the Arkansas river. It was dusty, I saw cattle walking
right over it. It was perfectly dry. It was so low I couldn't
get only a few miles below the mouth of the Grand,
486 which was right at Gibson, with a dugout, and I had to
abandon it, and get a horse and go the rest of the way
with a horse.

Government here offered in evidence the testimony of
DAVID D. CHAPMAN, in the case of Kansas [es] Colorado,
recorded at page 1304 et seq., reading:

I live in Argenta, which is right across the river from
Little Rock. I am sixty six years of age. I have resided in

Little Rock and Vicinity for forty years. I was engaged in plying the Arkansas river as a boatman for about forty years. I ceased doing so about seven years ago.

I remember a boat called the "Aunt Sally" Yes sir, it took a trip to Arkansas City, Kansas. I was captain of that boat. The inducement that was offered me to take that boat to Arkansas City was there was said to be \$700 for the first boat that would make the trip, so taking this boat I went there to get that, and it was a kind of experiment. I didn't get the money. Yes sir, I had some little difficulty in getting back. We were fifteen days going up there from Little Rock and twelve days, about, in getting back. Fort Gibson was considered the head of navigation when I first began to ply the river. I would not consider the river navigable above Fort Gibson. In those days early stern wheel boats were used. They do not use the same character of boats now that we had forty years ago. It is a different class of boats entirely. No sir, I don't think we could navigate the river to the same extent and in the same seasons of the year now as we did when I first began if we used the same kind of boats, because the river is not as deep as it was when I first commenced steamboating, I don't think. I mean it has spread out over more ground, yes, sir. If the water were confined to the same width as it was, then I don't know but what it would be just about the same. Of course we had some difficulties then, and we have now, and there is a different class of boats now from what there was then. Of course, we have had forty years of experience, or I have, steamboating. If I was going to build a boat

I should not build one like they built forty years ago
487 because the one they built then would draw three feet light. The boat I would construct now would draw twelve inches. A boat down here now can carry twelve to fourteen hundred bales of cotton and it only takes sixteen inches of water light, where the same class of boat of the same size forty years ago would draw three and a half feet without a pound of freight in it. You can load that boat down now and she will carry 1200 bales of cotton on the same amount of water that a boat forty years ago would have floated on light. There is the difference.

Q. If you would use the same kind of boats now as then and the water was confined to the same channel, would you have any more difficulty now in navigating than you would then?

A. I don't know as you would, if it was confined to the same width.

I built the first house that was ever built in Argenta, where I am now living, in 1864. From this "point of rocks" that is named Little Rock now I have stood there when I was a young man and threw a rock across the river. Now if I had four throws I couldn't do it. Where I owned property in Argenta it is two hundred yards now—fully two hundred yards—out in the river. There has been two blocks—that is over two hundred yards—over two blocks—caved in the river. The river is three times as wide as when I first came here in 1856. This condition prevails all the way along the river. Well, when I first came here in 1856 of course there were no settlements. There was very little land cleared up right immediately on the river. It was all timber, and you know where it is timber the roots and one thing or another keep the banks from cleaving, and when you cut that timber off and clear it off it just naturally caves. Well, this river caves from both sides.

Q. Now, taking into consideration the difference in the construction of boats now and those in the early days and the necessity for using those modern boats, state
488 whether or not in your judgment the Arkansas river can be made navigable in and around Little Rock and Fort Smith and Fort Gibson.

A. Yes, I believe it could with the boats they have now or that could be built now.

Yes, to confine the water in the channel so that you could navigate it would require the expenditure of a vast sum of money. In my judgment it would not justify the expenditure of that money to make it navigable with these modern boats, no, sir.

Cross-Examination on behalf of Complainant

By Mr. Ashbaugh:

It was in 1878 I went up the river as captain of the "Aunt Sally". We started from Little Rock. We were fifteen days in going up, but we only ran in the day time and would lay up over night. The boat had steam power equal to about 20 horsepower, and drew sixteen inches of water. We were only about eight days on the back trip. Coming down, we went with the current. It all depends on the difference in the current. We met two or three pretty good rises on the way up, making a pretty heavy current. Yes, there was surplus water in the river when we went up. There was less water in the river coming down than when we went up. We were at Arkansas City about four days. We gave excursions on the

Fourth of July and had a good ride around the country look-at it.

I recognize Complainant's exhibit A-6 as a picture of the "Aunt Sally" taken on the Fourth of July, 1878, at Arkansas City. I was right in the pilot house when that was taken, with a band of music on top. There were three hundred and sixty five persons on the boat at that time. I collected that many fares; I don't know how many got away. That boat drew two feet of water when loaded. We had no load coming down. The reason was the river was falling very fast and I knew enough about the Arkansas River to know if I didn't get out
 489 then I wouldn't get out, and I had my boat up there and wanted to get away. We were offered to have a load given us if we would carry it out, but I didn't want it. I wouldn't take it. Of course we didn't get any of this money they offered as a bonus for the first boat that came there, and I felt mighty sore over it and I didn't want anything. I was Irish, and am still Irish, and I wouldn't let them put a bushel of wheat on there for anything. The railroad was not into Arkansas City then; it was at Wichita. It had not got down to Winfield. I think this was a scheme to get this boat up there to have it done and that it had something to do with the bringing of the road there. We went up the Walnut river seven miles.

I never went up the river as far as Fort Gibson again. That was my only trip. That was all my experience. I couldn't state what rivers flow into the Arkansas river between Fort Gibson and Arkansas City. I am not a pilot any farther up than Fort Smith, but I have been, though, to Fort Gibson.

I couldn't answer what rivers rise in Kansas and flow into the Arkansas between Fort Gibson and Wichita. I don't know anything about the Neosho River. The Walnut flows in at Arkansas City. As to how much water there was in the Arkansas river at the junction of the Arkansas and the Walnut when I was there in July 1878, well, sir, I didn't take any soundings, but I judge there was five or six feet. The river was up at that time. It took several days for it to go down. All the streams I spoke of between Little Rock and Arkansas City were perennial streams. I should think that there would be fully two-thirds of the flow of the Arkansas River as it flows past Little Rock comes from all those streams below the mouth of the Walnut River at Arkansas City. The Arkansas river at Little Rock is fully five hundred yards wide, and at medium low water would be thirty inches on the aver-

age. There are places here where it is ten, fifteen or twenty feet deep, and there are places near Little Rock where the river during medium low water is thirty feet deep. The Grand river is half the size of the Arkansas, fully, if not a little more. It is the biggest river there is above here. I think about half of the flow of the Arkansas river below the mouth of the Grand comes from the Grand river. The Porteau is about as large as the Grand. The Canadian is a clear stream. I never saw it when it was muddy, and every time I was there there was about three feet of water in it, on the average and it was two hundred and fifty or three hundred feet wide, perhaps a little wider.

As to the effect upon the Arkansas river if all the water that flows in it above the city of Wichita should be taken out, well, sir, I think it would have a perceptible effect here at Little Rock. Of course to take that water away, it would be a detriment. Of course that is only just about half the length of the river; that is, from Wichita to its source; and to take that water undoubtedly it would cripple the balance. It does its part, whatever that might be. No, sir, I don't think that if you should take all of the water that might naturally flow in the river above Wichita it would not make a perceptible difference in the flow of the river at Little Rock. I think it would make a difference, and a very great difference, because there are several streams coming in. Of course I don't know that. I never was up there. Now, it is a long ways up through Kansas and Colorado, you know, where that water comes. There is a good deal of water comes from there, and to take it away would make a perceptible change. I think that all of the streams that flow into the Arkansas river, like the Grand, the Porteau, the Illinois and the Mulberry, flow now as much as they did in the earlier years, on the average. I don't know that their flow has decreased. I don't see any difference. Well, I should say, of course, that to take the amount of water that would come down through the Arkansas river—to take it away, it would make a great difference in the flow of the water in the Arkansas proper. Of course it has a great many tributaries that supply water, but if you cut off that it would make a great difference. I don't know what the volume of the Arkansas River is at Little Rock.

Cross-Examination on behalf of defendants,

By Mr. Hayt:

At the time I went up the river with the "Aunt Sally" in 1878 there was plenty of water in the river going up, and when we were up there we ran these excursions on the Walnut

river. There had been a flood just previous to that in the latter river, and we found plenty of water to run up and down that river for seven miles—we called it seven miles—and we remained there six days. Yes, the water fell very rapidly in the Walnut while we were there. It was falling all the time. When I first got there there was about twenty feet of water and when I left there they could ford cattle right across in front of my boat. This was on the Walnut river. I suppose there was about three feet of water. This was on the 4th, 5th, 6th and 7th days of July. I didn't bring any cargo down, because it was not safe on account of the falling water in the Walnut river and in the Arkansas. The "Aunt Sally" drew about sixteen inches light and two feet when loaded. Yes, we got around once or twice in coming down by taking the wrong shoot. In all my long experience in boating on the river here and elsewhere and from my experience in 1878 and since that time on the Arkansas river, I regard it in the upper reaches, in the vicinity of Wichita and above Fort Gibson, as a very treacherous stream, incapable of practicable navigation, yes, sir.

You understand in regard to this purse offered by the people of Arkansas City, I don't know anything about the railroad part of it, but the purse was for \$700, offered for the first steamboat that would come up to Arkansas City to get it. I was taking the chances of going there and getting it, and I got left. They had a string to it. Undoubtedly it was the case that it was a scheme to have some influence on the building of a railroad, because the people of Arkansas City and Winfield, those people there of course they wanted to get a railroad there, and I understood as much, and they came with me down to Fort Smith. I had four people from Winfield and Arkansas City and the vicinity, on the boat there that came down with me to Fort Smith to see what could be done. In the meantime there was a lot of money made up, seven or eight or ten or twelve thousand dollars, and they got me to draw the plans of this little boat called the "Cleveland". She belonged to the United States Government. I helped to plan that boat and the barges and they paid me \$5 a day for my services. After that trip was made, within the next four or five years, railroads were built through the country along the river, and the building of those roads greatly lessened the freight rates and made it unprofitable to attempt any navigation even in a small way on the river. A boat that will draw about sixteen inches of water now would carry in the neighborhood of a thousand bales of cotton. That has been the condition for about forty years. They will draw

less water than a boat would light, without anything on her, forty years ago. To sum it all up, the Arkansas river is a river of shifting sands and varying depths of water, yes, sir, and always will be as long as time extends. I don't think there is money enough in the United States Treasury to make this river navigable the year round under any conditions whatever."

Government here offered in evidence the testimony of M. M. MURDOCK, from pages 260 and 261, Kansas-Colorado record, reading:

"My boy was in Congress and he had a scheme with some fellows. He has no moneyed interest, simply a political interest. I was one of the fellows that started the appropriations for the Arkansas river, and we built boats out here. Senator Plum and myself and one or two other fellows got up a scheme of running a fellow for Congress from Topeka for this district down here, a gorrymandered district, that I got through the State Senate myself, to get the support of the people down here for the fellows up there. The advocacy of the navigability of the Arkasas caught them. The freight rate schedules of the railroads at the present time are
493 all based upon navigable waters. The running of steam boats up and down the river would give water rates for our wholesalers. Of course the engineers sent out here were told to keep in touch with me, because at that time I was quite a fellow here. One of these engineers assured me that there could be a channel put through from here down to Arkansas City sufficient for navigation with little boats. They built their boats here at Sankey's on the channel. A fellow by the name of Walton built a flat boat at Arkansas City and put a saw mill engine on it and some kind of a wheel and started for Wichita. He got here within ten or twelve miles and went back. That must have been in 1870. They built a number of boats here in the early days to haul lumber down to Arkansas City. This was at the end of the railroad. There was no other road in this city. The Santa Fe came here and stopped. I didn't pay much attention to it, but I know they built some boats here, little flat boats that came from Colora lo down. They never carried on any commerce further than that. I don't know but there was some flour or something shipped down in the river flats. No boat ever got back that went down. They didn't go with that idea. The river was not navigable for any practical purpose after your folks commenced taking the water, and before that it was not, in my honest judgment, navigable for any practical purpose. Grant once said when

he was lieutenant in the army that the Arkansas river would be navigable from this city to its mouth if they would copper-line it, and I guess he was about right, because I know how shifting those sands are."

Government here offered in evidence the testimony of JOHN W. HARRISON, from pages 276 to 277 of the Kansas-Colorado record, reading:

"In the good old days we had some high water, but the banks of the river always took care of it. The river at that point was quite a large stream originally. Without measuring it, I would say it was a thousand feet on an average from
494 bank to bank, and there were times when that thousand feet were covered with water. The bed of the river is composed of loose, shifting sand that blows with the wind when it is dry. When the high waters come the bed of the river changed and took it clean out. The flood would apparently carry off this drift sand to quite an extent. Whenever high water would come and subside, the river might be where it was before it came and it might have moved almost over to the other side of the channel, and the next flood it might move back."

Government here offered in evidence the testimony of R. E. LAWRENCE, from page 333 of the Kansas-Colorado record, reading:

"We had the boom here about 1886, 1887 and 1888.

I don't say that the Arkansas river at this point is a navigable stream for commercial purposes. I don't think it was ever practicable to navigate the river at this point. We did hope at one time that by dredging the river that possibly it might be in certain seasons of the year, as far as Wichita. It was dredged by the Government, but no navigation took place after that. The dredging boat itself came up, and that was all. With all our efforts we didn't get navigation; we didn't have water enough. At the time we tried to make it navigable down through the country there were no railroads through Wichita. We had to go by wagons entirely and we thought we might get some improvement over wagon hauling. At that time it would have been of real value to navigate the river. Before the Government got through with dredging it out the water was gone."

Government here offered in evidence as Exhibit 66 a part of a historical work contained on page 132 of Volume 9, Kansas Academy of Science, for 1883-4, being an extract from an article entitled The Age of Kansas, by B. B. Smyth, reading:

495 "The earth that is carried down by the Kaw finds its way into the river mostly by the action of water. On the other hand, the earth that is carried down by the Arkansas from the surface of Kansas is carried into the river mostly by the wind. The clayey and alkaline potions are carried away quite readily; the sand goes out slowly. In winter, when the north winds prevail, the Arkansas is dry, and the wind blows considerable sand out of the bed of the river, and makes ranges of sand-hills all along south of the river. In summer, when the prevailing winds are south, the river is filled with water and no sand is blown out. From Hutchinson to Arkansas City, over which course the river runs nearly south and is seldom dry, there are no sand-hills."

496 R. E. Cook, Muskogee, Oklahoma, called by the complainant as a witness, testified on direct examination by Mr. Kearful as follows:

Witness states that he is thirty-seven years old and that he is employed by the Commercial National Bank of Muskogee as note teller. He is acquainted with the Arkansas river, and has been for about twenty-years. He has lived at Muskogee probably fifteen or sixteen years, during which time he has made two trips from Muskogee to the mouth, or to the cut-off of White River. Witness states that he has been a licensed pilot, and has navigated boats himself on the Arkansas river. He owned a little boat, the "Carrie Clyde" that he bought from up in the Ohio river to a little town by the name of "Choskey", about twenty miles above the mouth of the Grand river where it comes into the Arkansas. He also brought the steamboat "The City of Muskogee" from Cincinnati, Ohio, to Muskogee; he also made several trips with the steamboat "The Mary D" from Muskogee to Redland, a railroad point just above Fort Smith. Witness states that The Mary D would likely have been registered at fifty tons, approximately, her draft being from 16 to 18 inches light and loaded not to exceed 36 inches. Witness states, to his knowledge, The Mary D never went above the mouth of the Grand River. The City of Muskogee was registered at 98 tons and drew a little more water loaded than The Mary D, otherwise she was of the same draft. Witness states that he represented

the City and procured that boat and brought it to Muskogee for the city, the funds used in the purchase of the boat were derived from public subscription by the Commercial Club. Not long afterwards the boat was sold. Witness states that the boat did not bring near the purchase price at the sale, and the contribution made by himself towards the purchase was not returned. At the time he brought the boat up to Muskogee the stage of the water was not an extreme low stage nor was it a high stage. It was what he termed fairly good

water. Witness does not think that the boat made any
497 other trips after he brought her up the river. The

Carrie Clyde, witness does not believe, was as large as the Mary D. He would say she drew light 16 to 18 inches, and loaded about 24 inches, maybe 30. The Carrie Clyde was the boat that he took up above the mouth of the Grand to a place called "Choskey", twenty miles above the mouth. He did not personally make the trip with the boat but he saw her up at Choskey, her destination. The boat was loaded, and an attempt to take it down the river was made, but it hung on a bar and sank where it was, never taken off. The Cargo was unloaded on flat bottom ferry boats and carried to the bank. Witness states that the character of the bed of the river from Fort Smith on up as far as he knows is sandy, some spots in it being rock and gravel. He further stated that there are difficulties in following the channel of the river when covered with water. It changes quite often and one can hardly have a knowledge of the bed sufficient to follow the channel; you think you are in the channel and you will go in a cut-off and be behind a bar. Witness states that it is not possible to run any place where you see water. You can't follow the swift current of the water because it might be swift at the upper end and spread on a sandbar at the ower end—that is, you can't with a boat. One can't always see where the actual channel of the river is—the deep part; you might see it, but witness does not believe that it could be designed by looking at it. He states that at a point in the river between Fort Smith and as far as he knows it, above the Grand, that he did follow the channel, but above the Grand there isn't as much water in the river and not a defined channel like there is below. In witness's judgment the relative width between banks above the Grand is wider; there may be exceptions however, but there are points below the Grand that are very narrow.

Cross-Examination

By Mr. Freeling:

Witness states that during his acquaintance on the river he has had experience with three different boats himself, 498 his first experience being with the Carrie Clyde, which was taken to Choskey about fourteen years ago—1901. He was the sole owner of the boat which he purchased at Columbus, Kentucky. The boat was under fifty tons and not quite as large as The Mary D; that is, in carrying capacity. Her length was about 65 feet. Witness considered his boat a small vessel and could not state whether it was just below the average in size as he did not know what constituted an average sized boat. His boat had a scow bow that was made for shallow water purposes. He brought the boat personally from Kentucky to Little Rock. He entered the Arkansas river at the point known as the 'Cut-off' in Arkansas. Witness states that while he was on the boat he did not pilot it personally as he, had employed a licensed pilot to Little Rock. He explained that a pilot only had a license on certain sections of the river. He states that the boat was not loaded on his trip. Before arriving at Little Rock witness states they struck a sand-bar or two shortly after entering the Arkansas River. He does not recall whether he had any trouble from Little Rock on. He states that he piloted the boat from Fort Smith, Arkansas, on. He left the boat at Little Rock and as he recalls got on the boat again at Dardanelles. Witness does not recall the points which he touched after leaving Fort Smith. While he piloted the boat part of the way the pilot who was on the boat stayed on. The boat was tied up at Muskogee for quite a while on account of the Frisco Railroad Company building a bridge across the Arkansas at that point, and he couldn't get under it. Witness does not recall having had any trouble on the Carrie Clyde from Fort Smith to Muskogee. Witness states that the boat remained at Muskogee probably a month, six weeks, or perhaps sixty days. After the Frisco bridge was completed he could not go under it. The plans changed, however, and the bridge raised and let him under. Witness state that he recalls that the original specifications did not allow boats to pass under the bridge but according to his understanding the later ones did, and permitted 499 boats to pass under. The only trip that the Carrie Clyde took out of Muskogee was the trip up the Arkansas to her destination, Choskey, about twenty miles from Muskogee, the boat being for use at that point. Witness states that a man by the name of "Bupree", now dead, piloted the boat from Muskogee. He states that while he was not on the

boat he saw her at Choskey. He does not recall any trouble that might have been had on the trip up the river. Witness states that a man by the name of Williams was attempting to pilot the boat on the return trip when the boat was sunk. The direct cause of the trouble was striking a sand-bar. Witness states that he was notified of this and he went out to the boat and attempted to get her off the bar but the river had fallen; he arrived there at night. She hung on the bar in the day time and he transferred the cargo to the flat-bottom ferry boats and took it to the bank of the river, afterwards the river continued to fall and left the Carrie Clyde high and dry on the bar. The next rise of the river instead of rising enough to float the boat, rose a little and the sand packed around the boat and when the river rose again the boat instead of turning loose from the bar stuck there and she just came on over and when the river went down the sand packed clear up over the hull of the boat.

Witness states that he never attempted to dig her up. The lumber that he took off of the Carrie Clyde went into the construction of a wagon bridge across the Arkansas river. After the lumber was landed on the bank of the river, opposite from where the boat had sunk, he hauled it down with wagons and teams. Witness states that the flat boats used in transferring the lumber to the banks at the river were unable to reach the shores; he recalls that the negroes had to put the lumber on their shoulders and wade from the flat boats to the bank, notwithstanding the fact that the flat boats did not draw as much water as the Carrie Clyde. Witness could not state whether or not there was a channel in the river that the Carrie Clyde could have passed through at the time she hung up on the bar. He concluded that the scheme he had attempted

500 ed was impractical and he dropped it, thereby losing what investment he made in the boat. Witness states that in ordinary stages of the water it would be more or less a matter of luck if one could get up and down with a boat. In low water you could not get up at all. Witness states that at the time the attempt was made to bring the Carrie Clyde down the river she was loaded and had been waiting some time for more water in the river. He had cautioned them not to attempt to bring the boat down until he got there, but there was quite a little bit of water that came down and they started down with it. He states that he does not recall the exact stage of the water but if it had been extremely high water there would be no trouble in going up and down the river so far as the stream is concerned but of course the bridges would interfere now. Witness states that there are several bridges

you could not go under with a skiff at the present time. He stated that he believes boats could navigate the river in what he would call ordinary high water. He states that the boat "City of Muskogee" was purchased above six years ago, the purchase was made at Jeffersonville, Indiana, the boat having been built there under contract. The City of Muskogee was about twice as large in carrying capacity or more than the Carrie Clyde and her draft loaded probably 36 inches and from 16 to 20 inches light. Witness thinks that the contract price of this boat was \$12,000. He does not recall the name of the person who piloted her to the City of Muskogee. She was carrying a double crew and as witness recalls there were eight separate pilots on the way down, a pilot being licensed only for a certain division of the river which he is supposed to know. Witness's division was from Fort Smith north to Tulsa. The furthest point north he ever conducted a vessel was to the mouth of the Grand River. The vessel, "City of Muskogee" was loaded with wire nails when she came from Cincinnati, Ohio, down. Witness believes that he had the wheel when the vessel arrived at Muskogee; there were, however, several pilots out of the Mississippi river making the trip with them, and a pilot from Memphis, put on by the inspector, who would relieve one another all along the trip. Witness states that he was on the boat all the way and that he delivered the cargo of wire nails to the Traction Company at the wharf in Muskogee. These wire nails were loaded at Evansville and came from Kokomo, Indiana. Witness does not recall that the boat ever made another trip except to go out and be sold—never returned. Witness states that his understanding is that the boat was purchased by Dr. Bennett and Mr. Duding from the Commercial Club and they sold it to a sand and gravel company who used her to handle sand and gravel barges at the mouth of Grand river and up in Grand River. They had placed the original pumps on the front part of her bow and used her boilers for steam purposes to run the pumps with. Witness states that as Muskogee is three or four miles back from the river he cannot state positively what the boat was used for, he does not understand the exact system of the gravel companies but they use pumps to pump the sand out of the river on to other barges and let the water run off and then the sand is loaded on cars. The exact system he does not know. Witness states that after he delivered the boat to the city of Muskogee he made a short trip on her to a little town called "Falls City" up the Vardigris river, four or five miles above where it empties into the Arkansas. Witness states that when the boat first arrived it was quite a cur-

iosity and they ran little short excursions extending for a mile or two. To his knowledge on these short trips the passengers were never charged for the trip. The boat was originally purchased to demonstrate the navigability of the Arkansas river by the Chamber of Commerce in Muskogee who were trying to get an appropriation through Congress. Witness states that he has heard that some of the little gasoline boats hauled whiskey up and down the river. He has seen one or two of these gasoline boats tied up at Muskogee. He has no knowledge of what these boats are used for. There was one that attempted to haul freight between Muskogee and Fort Smith but he could not say whether it actually did nor does he recall the name of the boat or its owner. Witness thinks

502 that perhaps his name was Blakely. Witness states that he owned no interest in The Mary D she was practically a 50 ton boat. He thinks that C. N. Haskell was one of the moving spirits in the ownership of The Mary D and that it was more or less of a project to affect freight rates and to demonstrate the navigability of the river, as was the boat "City of Muskogee". Witness states that he understood that it had the effect of lowering the freight rates, they being put on an equality with Fort Smith in rates that had not therefore prevailed. Witness states that he took The Mary D to Redlands, approximately 114 miles up the river. On this trip, witness states that they carried a few articles down, but was loaded coming back. The return trip was made by relays, owing to difficulty. On the return trip she was loaded with wagons and barbed wire and nails, probably a couple of car loads. Witness considered the cargo a heavy one. He does not recall how long it took to make the trip down or up the river. On the return trip she tied up below Webbers Falls on account of the low water, from which place he got her out and brought up on a little rise of the river. Witness states that The Mary D did not have as much power as she should have for a boat of her size, and you could not make her force herself over the bar as you could have done if there was more power. After getting over the shallow point at Webber Falls, witness states that had very good water on up to Muskogee. Witness states that in ordinary high water there would be plenty of water for The Mary D to make the trip as she draws 24 to 30 inches loaded. The entire trip witness states was made in the State of Oklahoma, covering a distance of 85 to 90 miles. Witness states that in his judgment a boat of the size of The Mary D could be used today on that part of the river from the mouth of the Grand to Redlands, and he thinks that The Mary D could make a trip

to Choskey, twenty miles beyond the mouth of the Grand, in high water. He further states that the Carrie Clyde, which was stranded on the sand-bar, could have made the trip back in ordinary high water, and that it could probably be made any where in the river without following the channel.

Dedirect Examination

By Mr. Kersful:

Witness states that at the time he took the Carrie Clyde up the Choskey she was light. Witness states, in comparison to the Arkansas the Verdigris river is a muddy stream with steep banks, and a swift narrow stream, the channel being of 02 confined to narrow quarters, while the Arkansas has an extremely wide and sandy bed, the water being spread out over quite a surface. He states that the Verdigris has a mud bed. Witness also states that the Grand River is more like the Verdigris, being very swift with a high bank and a great deal of gravel.

Witness states that he does not know anything about the relative water flow of the Grand and Arkansas at low water nor at ordinary water.

MIKE CONLAN, Oklahoma City, Oklahoma, testified as a witness for the Government on direct examination by Mr. Kearful, as follows:

Witness states that he is 50 years old and is in the flour business at Oklahoma City. He states that he used to know the Arkansas river, from 1885 until 1892, during all of which time he was on the river from Fort Smith up. He states that he knew the river pretty well up to the mouth of the Cimarron. Witness states that he is familiar with the character of the bed and banks of the river and the water flow during the period that he was there. Witness states that the bed is practically a sand-bar but of course there are strips of the river that are very good but the most of it is wide and sandy. The best part of the river in the section from Fort Smith to the Cimarron river when the witness was on the river was from Webber Falls to the mouth of Grand river. Witness states that his experience on the Arkansas river in the section referred to was in getting out walnut logs on the Arkansas river and its tributaries. He states that he also had a steamboat which he used in that connection; he states that he used to run the logs and take them down on barges or anything he

could get them down on. Witness states that the
504 fartherest they ever ran the steamboat was about
twelve or fifteen miles above Muskogee. The steam-
boat referred to, witness states, was about 100 tons and at
the time they made their runs up the river the water was high.
They did not run the boat up at the ordinary low water. Wit-
ness explains that in the Arkansas river at that time there
was a ten foot rise. He states that once in awhile they went
to the M. K. & T bridge three or four miles above the mouth
of the Grand river. Witness states that the Arkansas river
is not influenced by the flow of the Grand river at high water.
He states that the Grand River is about two miles above the
Virdigris river. Referring to his experience in floating any-
thing above the bridge, witness states that they tried to get
the boat up there as they had some logs at Choskey and they
thought they could make it on a good rise. They got to the
M. K. & T. bridge and had to take the stack down to get under
the bridge the water was so high, after which they got up
about twelve or fifteen miles and could not go any further and
consumed four days getting from there back to the bridge on
account of there being no channel. Witness states that the
width of the bed of the river between banks above the Grand
is a great deal wider than the width between banks below. He
further states that the Grand River has more water in it than
the Arkansas at ordinary low water stage, and the year
around the Grand river has a great deal more steady low
water flow than the Arkansas. Witness states that he has
had experience in attempting to afloat logs down the Arkan-
sas above the Grand river. This experience was in trying to
get logs from Choskey down, which failed, for the reason that
there was not water enough, and the logs were hauled at Ca-
toosa. These walnut logs, he thinks, were of different sizes—
some large and some small. Witness states that Choskey is
about twenty-five miles above the Grand river. He states
that at the time he was on the river he knew of several men
who attempted to float things on the river above Tulsa, re-
sulting in the logs being hauled down. He states that
505 he has heard of attempts being made to navigate the
river in the reach of the river referred to by him. Per-
sonally he does not know about it. Witness states that some
times there is pretty good water in the river and some times
not, occasioned by freshets, but these cannot be depended up-
on to arrive at a certain time of the year. The length of time
that these freshets last cannot be depended upon either. They
usually come quickly and go down quickly and then witness
states that he could never foretell the time when they are com-

ing. In relating the difficulties in following the channel of the river above the Grand when there is a good deal of water in the river, witness stated that there was no channel in the river that he ever found on the trip that he made. He had some of the best rivermen in that country for the special purpose of going to Choskey. There were three pilots and twelve or fifteen of the best rivermen and they waded the river to find a channel; he states that they did not just stop the boat and go back but looked for a channel and could not find any. At the time there was a ten foot rise in the river but the water was falling. Witness states that in 1891 he bought all the down timber in the Osage Nation and had the logs at the mouth of the Cimarron waiting for a rise to run them down to Tulsa in order to save the expense of hauling. He had a man watching at that point to get them out at the proper time if the rise did come. A pretty good rise occurred in the Arkansas and witness went on horse back to the mouth of the Cimarron river where he, and the men stationed there, had the logs rafted in bunches of six or ten and a man started down on each; some of them got half a mile, and one fellow got three miles down the river, they all stranded and could not get any further. The following summer most of the logs were hauled out of the river, and hauled to Tulsa on wagons.

Cross-Examination

By Mr. Freeling:

Witness states that the stretch from Webbers Falls to the mouth of Grand River is the narrowest part of the Arkansas above Fort Smith that he knows of, the bluffs coming pretty close to the banks; the banks are generally higher than
506 they are either above or below. He judged that the width of the river between those points would average a quarter of a mile, and as to the average depth in low water he stated their boat drew about 24 inches of water and they could go up and down that stretch most any time. Witness states that the boat referred to by him was the "William Druhe"—about 100 ton, and considered a very small boat. He stated that he was not acquainted with "The Mary D", "The City of Muskogee" or the "Carrie Clyde". The "William Druhe" was about 100 feet in length and drew about three or four inches, not being built for freight work. Witness states that they never loaded the boat—only with men and provisions, and it was used between Fort Smith and the mouth of Grand river—what used to be called 104 miles from Muskogee. The distance from Muskogee to the mouth of the Grand witness believes to be five or six miles. Witness states that he has made hundreds of trips over that stretch of the river,

but never without trouble. When the river was ordinarily high the trouble then was in hugging the bar to close; one might hit the land, but if they kept in the water there would be no trouble—just a question of having a little power; making it, Witness states that he never made a trip in that boat in low water between Fort Smith and the Grand. The boat was used mostly in the winter time, usually from July until the harvest there was not much doing with the boat on account of low water, which was the general rule every year. Witness states that he used the boat up and down the river for a period of about six years and that he made one trip north of the mouth of the Grand river, perhaps eighteen or twenty miles. On this trip they were obliged to put out a line and pull the boat about four miles at different places. For half a mile at a time across some of the bars they pulled the boat bodily. He stated that they could see the bar with the naked eye. At the time the water was falling and not considered low and they went up as far as they could. Witness states that he had never heard of another boat going beyond

507 that point, though he has heard of them. At the time that he was on the river witness states that the “Druhe”, “The Jennie May”, “The Cleveland”, and “The Border City” were there. “The Jennie May” was owned by Walter Huff, and ran as far north as Fort Gibson, and perhaps to Roseville, Arkansas. She also went to Fort Gibson, about two miles up the river from the mouth of the Grand. “The Jennie May” witness states was perhaps a 150 ton boat and hauled cotton, cottonseed, and merchandise of all kinds—cotton being one of the products of the community on the Arkansas river. Witness states that the pilot of the “Jennie May” was Walter Huff, and that she was used just during the season. Witness states that Huff built “The Cleveland” and sold it to the Government. “The Cleveland” was about the same tonnage as the “Jennie May” and was used for a freight boat between Fort Smith and Webbers Falls before it was sold to the Government. She would take a load of merchandise up and bring back cotton, cotton-seed or whatever there was to bring back. Witness states that from Muskogee to Webbers Falls by river is about 50 or 60 miles; he also states that he has seen the Cleveland at the mouth of the Grand but he does not know of his knowledge that she ever went above the mouth of the Grand. Witness states that he has known years that the Cleveland would not be used perhaps over two weeks between Grand river and Fort Smith, and at other times it might be used for several months in regular service. He states that he cannot give the year that the boat was only used for two weeks, as it has been a long time

ago, and that it was an exceptional year. In ordinary years witness stated that the boat was probably used three or four months, mostly in the winter months. Witness states that sometimes you can anticipate the rise in the river and at other times they dont come, and the rivermen look for the rises in the Fall and winter months during which period these boats would ply between Fort Smith and Webbers Falls. Witness states that he thinks Ben Blakely owned "The Border City"; at all events he ran the boat. "The Border City" was a
508 little larger than the other boats, perhaps 175 tons or larger, and in his judgment 110 to 20 feet long. Witness states that Blakely was the pilot, captain, mate and everything else on this steamboat. Witness states that all the boats referred to by him were stern-wheelers and hauled about the same merchandise. The cargo of "The Border City" coming from Fort Smith would consist of merchandise, and going the other way would be products of the country. He states that at the time he left the river all the boats were there except the "Jennie May" which was sunk—caused by striking a snag. He states that it is a little harder to keep from striking a snag in the Arkansas than in any other place. He also states that the Cleveland was sold to the Government for use in Government work above Fort Smith, at a place called "Government Island", 12 miles above Fort Smith where some riprapping was put in. Witness states that he used the river for floating logs when there was water enough. He states that the Cimarron river a little ways above the mouth will float logs at high water some times. At extremely high water witness has had no experience in this river. The logs floated by witness were from the mouth of the South Canadian to Fort Smith. The Canadian empties into the Arkansas just above Webbers Falls from which point he would use the Arkansas to Fort Smith. He states that there was a great deal of the time that logs could not be floated over that part of the river. Witness states that the boats referred to by him were out of Fort Smith, and used the river above there, but there were boats that came up to Fort Smith from below. He remembers one, "The Ella" that ran up to Fort Smith but does not know her route. Perhaps from Little Rock. Witness states that he has heard of the "Carrie Clyde", "The City of Muskogee" and "The Mary D" but not while he was on the river. He also states that he has seen small fishing
509 schooners and fishing skiffs on the river but has never seen any motor or gasoline boats. Witness states that he has been to Muskogee but did not notice any launches tied up in Hyde Park, for the reason that he did not go there.

Redirect Examination

By Mr. Kearful:

Witness states that he thinks "The Cleveland" was built at Fort Smith and that she was a flat-bottom boat, stern-wheeler, and designed for low water. He does not recollect her name before she was sold to the Government. Witness states that he has been on the "Border City" above Webbers Falls but don't remember just how far, nor whether it was as far as the mouth of Grand River. He does know that she ran from Fort Smith to Webber Falls, which was its territory. He does not know of its going above the mouth of the Grand. Witness states that perhaps the Government boat "Cleveland" was formerly named the "Kansas Millers" though upon reflection it does not seem to him that it was, though it might have been.

SAM P. BROOKS, Tulsa, Oklahoma, testified as a witness on behalf of the Government on direct examination by Mr. Taylor, as follows:

Witness has lived for the past eighteen years at Tulsa prior to which time he lived at Blackburn on the Arkansas river, about twelve miles above Cleveland, Oklahoma, on the Pawnee county side. He first went to Blackburn about 1895, since which time he has lived almost continuously at points on the river. Witness built a little boat while at Blackburn to take to Tulsa, Oklahoma, to ferry on. The size of the boat was 12x40, and empty would draw about four inches.

Witness states that he intended to take down about five tons of baled hay to Tulsa on the [trop] from Blackburn but concluded that he could not take that much, he therefore sold half of the hay and started down [tiver] with the balance; arriving at Cleveland he sold the hay as he could not make the trip. Witness states that from Blackburn to Cleveland by river is twenty miles, but straight across it is called twelve miles. This trip consumed about two days and was
 510 made by pushing with poles. He states that the boat loaded with the two and one-half tons of hay, himself and another man, drew seven or eight inches. In proceeding down the river witness states that he had lots of trouble. They waded a good deal of the time, pushing and pulling the boat off the bars as there wasn't enough water to run in. This trip was made in the month of April, the river being at ordinary low stage. After disposing of the hay at Cleveland, witness states that he proceeded down the river to Tulsa consuming about three days in making this trip, the water being

about the same as it was above Cleveland. He further states that though they had unloaded the hay, and the boat was drawing only about 4 inches of water they got stuck on the bars along the river all the way which necessitated their getting out and wading to pull her off. Witness states that they could not follow the channel for the reason that the channel would run out and they did not have any. He states that the character of the bed of the river is sandy which moves from one location to another all the time—sometimes you could depend upon where you had found the channel the day previous and sometimes you could not. Arriving at Tulsa witness states that he used the boat as a ferry across the river at that point, and continued in the ferrying business for about five years. Witness states that according to his observation on the river one could not depend on any certain time of the year for high water in the river that could be used for boating, it depended upon the rain. If it would rain away up the river and not down in this section of the country the rise would come suddenly and if it rained all the way down the river, the rise would be gradual. He states that most of the rises in the river occurred in the Spring of the year, the biggest rises occurring in May or June. He further states that his experience is that you could never depend upon any one month of the year for a good supply of water. Witness states that he had another boat that he hired a man to bring from Blackburn to Cleveland, at which point he met him, to take it down the river.

511 At that time the stage of the river was about three or four feet high. This boat was a small house-boat, 12x24, and it drew from six to eight inches loaded as it was at the time. On this trip the river was up three or four feet. Witness states that he knows John C. McLaughlin, who accompanied him on his first trip when he carried the hay in April, 1897. He states that after a rise in the river it is very [sifficult] to locate the channel that was in the river prior to the rise as it shifts about from one side to the middle, and to other places. As a rule if the river was high some of the sand-bars would level off, just be a bar and the water would run off. Of course, after the river gets lower, this water has got to form a channel in some parts of it; and the water will run over one side or the other, and these [flats] bars form; [than] they will run down one hundred, two hundred, three hundred yards before it forms another bar, and then it will drop off in water a foot, two feet, three feet deep over that bar and then run off again. Maybe there will be a small channel over next to the bank thirty feet or forty feet wide.

perhaps two or three feet of water, and it will run along and may be run down on another bar and run out. Then the channel will shift somewhere else and cut another place through. This was witness's experience in ferrying and he also found that the Arkansas river did not have much channel. He states that one might pick out a channel on the river at the point where he had his experience but it would be more or less guess work. He states that there is no way that he knows of avoiding getting into pockets behind a sandbar in going over the river in a light draft boat or any other kind of a boat. Basing his opinion on observation, and his own experience, witness states that he is of the opinion that the river could not be navigated, taking into consideration the [condition] as he knew them while there, and this applies to all of the river of which he has had experience and information.

Cross-Examination

By Mr. Freeling:

512 Witness states that the ferry boat referred to by him which he used at Tulsa was only used for a short while and that he built three or four boats while there. He states that it has been eighteen years since he engaged in the ferrying business at Tulsa, having left there in 1903. He states that after the bridge was built he discontinued the ferrying business. He further states that some times they would tie up for half a year as the people forded the river, but generally they could work for half of the year. Their charge for ferrying any team that horses were [hitches] to was 25¢ each way. The only commodities carried by the ferry were such as were on the wagons, consisting of farm products. Witness states that Blackburn is about sixty miles above Tulsa in an air line and that it is further by water; he also states that at the time he brought the load of hay from Blackburn to Cleveland the river was at ordinary low stage and if it had been high he could have brought the entire cargo, half of which he disposed of before leaving Blackburn. Witness states that Keystone is eighteen miles west of Tulsa but that he does not know of any craft [goign] to Tulsa from Keystone. He heard there was a boat coming to Tulsa hauling whiskey but he is not in the whiskey business and did not see it, nor does he know that considerable whiskey has been hauled from Keystone to Tulsa through the river. He states that there are some small boats, such as skiffs, a gasoline launch, and perhaps a houseboat or two on the river at Tulsa just below the bridge. These house-boats, witness states, were built there and that the people live in them, and don't

run out from Tulsa. Witness states that Dowens & Hate ran a ferry below him, their boat being about the same size as his, and ran about the same seasons of the year. In reply to the question as to whether a battle ship could not float in the river when it is high, witness states that it could not for the reason that the river never gets high enough, nor could ocean vessels be floated in the river. He states that 513 the river at the bridge is about 1410 feet wide and that during the past summer an ordinary river steamboat could be floated. He states that at ordinary stages the water at the bridge at Tulsa would be from one inch to three feet in depth in some places and in others from one inch to a foot deep. Five or six feet of water may be found in some places where the river will run around and strike the bank and cut out, whereas a few yards below it will run off shallow again. At the time witness testified he states that in the middle of the stream he could see the bottom most all the way across and he would judge it to be eight or ten inches of water, and the water was about four or five hundred feet wide. He again states that in ordinary high water [and] ordinary boat could be propelled but it could not be in low water. He states that in a four to six foot rise one could probably run a boat that would draw from ten to fourteen inches provided you can keep off the bars, but one can't tell where they are; if you knew where to find the deepest water it might be made all right. Witness states that there has been a number of small boats twelve or fourteen feet long, and maybe six or eight feet wide, that have been poled down the river during high water but he has never seen any steamboats.

Redirect Examination

By Mr. Taylor:

Witness states that during the time he has spent on the river he has never observed any commerce passing up and down on boats.

514 JOHN C. McLAUGHLIN, Tulsa, Oklahoma, testified as a witness for the Government on direct examination

By Mr. Taylor:

Witness states that he has lived at Tulsa for seventeen years and that he knows Mr. Sam P. Brooks, the witness who has just testified, with whom he was associated in the neighborhood of Blackburn, Oklahoma. Witness states that he went to Blackburn in 1898, since which time he has lived continuously along the Arkansas river in Oklahoma—at Tulsa,

Wekiwa, and at Heroy Point in Pawnee county, about two miles above the mouth of the Cimarron, at [whieg] point he operated a ferry. He states that Wekiwa is about eleven miles up the river from Tulsa. Witness states that he remembers making a trip with Mr. Brooks down the Arkansas in 1898 and that they started from Blackburn on the 26th day of April, the boat that he was on, as he recollects, was a flat-bottom boat, 12 x 40, and they carried about three or four tons of hay which they unloaded at Cleveland. He judged that the boat loaded with the hay drew six or seven inches of water, and unloaded about four inches. Accompanying him was S. P. Brooks and a man named "Sorrancy." Witness states that the trip consumed probably three days and that he recollects having trouble on the trip. He states that many times they would be stuck two or three hours on a bar and that they bogged themselves and could not get off the bars and would have to get out into the water and pry off into the channel and couldn't get over six or seven miles; at the time the river was at ordinary stage—it was not real low, but at average low water mark. Witness states that there was no way to avoid hitting the bars. There would be places with a little channel nine to ten feet wide, deep enough, and there would come a bar pointing right into it and you could not pass between the bar and the bank. From Cleveland, witness states, they went to Tulsa. This last

515 trip consumed about two days and one-half. There was no load on the boat other than the cooking utensils and provisions—not over five hundred pounds in weight. He states that the distance from Cleveland to Tulsa was called forty-five miles. Witness states that in making this trip they had a few stick ups on the bottoms, more frequently above the mouth of the Cimarron. On this trip he states the boat drew about four inches and they propelled it by poling. Witness states that he was in the ferry business with Mr. Brooks off and on for five years at Tulsa, transporting people and wagons across the river from one side to another. Witness states that they could not maintain a ferry at [ony] one spot. There was probably only a month in the year that you could hold to one landing which would be shut out at any time, when you would have to hunt a new landing. He states that their landings covered a stretch of ground on both sides of the river for over a quarter of a mile. He also states that they tried steam as well as gasoline power, but neither would work; during high water they were very good but to follow the business of a ferryman and get anything out of it one could not use steam or gasoline successfully. The most

successful boat that he used was one 38 x 11, carrying two teams, and two men to propel it with poles, drawing about eight or ten inches loaded. Witness states that they could not always take their load to the shore. There was always a landing built out and lots of times it was necessary to dump the load off in the water. Witness states that for from four to five days at times they would be tied up for the reason that they could not reach the bottom with the poles, but that five days was as much as he was ever tied up for as he recollects. He states that the rises sometimes occur suddenly, and at other times they are gradual for three or four days at a stretch. Witness states that in four or five feet of water you could not depend upon going down the river on a rise any distance at all and be able to get the boat back up the river without being hung up. A boat drawing twelve inches could probably be gotten up the river for thirty days during the past year and he states that that year was an unusual one. The two previous years he does not believe that the trip could have been made down the river and back during more than three days at any one time. He states that during the past year they have had more water than they have had for seven or eight years. Witness states that his experience as a ferryman on the Arkansas river covered a period of thirteen years, during which time they had a man by the name of Poole undertake to haul lumber and stuff up and down the river, but he made a failure of it, and they lost about a thousand dollars. He attempted to make these trips for about three months. The size of the boat used by Poole was 16 x 56 and she drew about ten or twelve inches. These attempts to operate the boat were made in the Spring of the year when the river was pretty high but Poole was unable to make any trip up the river with a load. He could, however, come back with a light load aboard. Witness states that he does not believe Poole made more than three or four trips from the mouth of the Cimarron, and a couple of miles above it, to Tulsa, carrying lumber. He states that Poole's boat was bought by Mr. Brooks. Witness stated that on one occasion when the ferry was shut down on account of the river being so low, and everyone was fording the river, he concluded that he would take a flat-bottom boat 14 x 24 feet [long] across the river to Sandy Springs, about seven or eight miles from Tulsa for a load of lumber. He put a sail on the boat and by wading went up the river, staking his channel with willows as he went up in order that he could follow the channel on the return trip. Arriving at Sandy Springs he loaded his boat and started back the next day but in making the down

trip he was pocketed seven different times. He would run in a pocket hole where a sandbar would cut right across the river and he would have to back back. At one place he was
 517 obliged to unload his lumber and pull the boat off the bar and reload it right in the water. He states that he started back early the next morning and was all day going those seven miles; meanwhile no change had occurred in the stage of the river. Ordinarily he should have made the trip in an hour and a half. Witness states that besides Poole he saw Ortner attempt to use the river but he has no personal knowledge of what success Ortner had. He states that he was raised on the Arkansas river and has been on the river at Tulsa since he was ten years old. Witness states it is very difficult for a person familiar with the river to tell exactly where the channel goes and that a person would not have much luck trying to get anywhere up the river. He further states that he has had experience enough to know that he would not try if he had plenty of money to carry merchandise up and down the river, and it could not be done successfully.

Cross-Examination

By Mr. Freeling:

Witness states that it would not be profitable to run a boat up and down the river. Referring to the trip from Cleveland to Tulsa, witness states he had a lot of trouble at the mouth of the Cimarron river, eighteen miles from Tulsa. From the mouth of the Cimarron down they were stuck up two or three days on bars that he could not see with the eye. He states that it is mighty hard to get around the bars as the channel shifts from one bank of the river to the other. He states that at places the river will spread out and get flat and the water will be shallow all the way across, then probably he will strike a stretch of water for a half a mile or a mile that is deeper and the channel closes in a little and then it will probably spread out again and become shallow. He states that in ordinary high water in the bed they were in they could have gone right along with their load of hay. Witness states
 518 that at the time they made this voyage the water was at medium stage though he has seen it lots lower than it was then. He states that the depth of the river at ordinary high water would be six or seven feet, and extremely high water about fourteen or fifteen feet. Witness states that for four or five days at a time they could not reach the bottom in places with their poles and that these poles were sixteen feet in length, five feet of which was above the water. He states that Brooks bought the boat from Poole in the Spring

of 1899, and that Mr. Brooks was then in his second year of ferrying. He states that this boat was propelled by steam and used for ferrying and that in high water it could have gone up and down the river though they never tried it. Witness states that he is not familiar with the river below Tulsa but he is to Arkansas City, and he states that he has never seen the "Jennie May", "The Cleveland", or "The Border City," though he has heard of them through the press; nor has he any knowledge of the "Carrie Clyde." He states that the boats seen at Tulsa consist of fishermens house-boats, and an old ferry boat that was used on the Cimarron river that got away and was caught by the boys at Tulsa and tied up at the bank. These house-boats, witness states, were lived in by the fishermen to beat paying rent, but don't go up and down the river, except now and then one gets loose and goes down to Muscogee, or to Fort Smith, during high water. Witness states that his experience on the river extends north of Tulsa but he does not know anything of it below. He states that he has been on the bank of the river about Fort Smith and as to looks the river at Fort Smith is much larger than at Tulsa, and has more water in it.

Redirect Examination

By Mr. Taylor:

Witness states that he has seen the time when it would be difficult to get a skiff up the river around the neighborhood of Tulsa, though not often. He states that he has seen
519 the time when a man would work a day to get a skiff up six miles.

Recross Examination

By Mr. Freeling:

Witness states that he has been on the Arkansas River almost exclusively, and that he is not familiar with other rivers

A. W. GUFFNEY, Tulsa county, testified as a witness on behalf of the Government on direct examination by Mr. Fain:

Witness states that he lives in Tulsa county about eighteen miles west of Tulsa, and that he is fifty years old. He states that he came into Tulsa County in the winter of 1888. He states that he is acquainted with the river from Tulsa to near the Cleveland bridge on the Arkansas, and that he is well acquainted with that stretch of the river from the mouth of the Cimarron to the bridge near Cleveland. He states that he has run a skiff up and down the river and helped to run ferry boats across the river; one of the ferry boats below the mouth

of the Cimarron, and one above about a mile. Witness states that he has been on and observed the river at high and low water. He states that at times in attempting to run a ferry boat across they would make it all right, and at other times they would be two or three hours in getting across, occasioned by the sand-bars. He states that there is a shifting, or changing channel, the bars drift from one side to the other, and it is mighty hard to tell where the channel is as they are changeable also. Witness states that you might cross the river today with a ferry boat and to-morrow there would be a sandbar in the way that you could not get across and would have to run below it or above it and that would necessitate changing the place of running the ferry up and down the river.

Witness states that it is a good deal the same way in 519a attempting to run skiffs. He states that you might cross with a skiff this morning and come back in the evening and not be able to get across without running up or down maybe one hundred yards, for the reason that in the meantime a sandbar had drifted in the way. Witness states that he has seen a good many floods come down the river but you could never tell ahead of time when they were coming. The floods, witness states, generally come along in May or June but they could not be depended upon at any particular time or any particular month. Witness further states that the river would stay up sometimes a week and sometimes three days. He states that he has known the river to start and rise for three or four days and he has also known it to rise four feet in one night. He states that after the river reaches its highest point, sometimes it goes right down in a day or two and at other times it takes a week. Generally speaking, these floods would come along in May, June or July, and then there would not be any more big rises until the following year about the same time. Occasionally the river rises in the winter time but there is no degree of certainty as to when the rises will come. Witness states that John Ortner ran a little steamboat from Cleveland down the river as far as the mouth of the Cimarron and sold it to an old man named Poole. That is the first attempt that he knows of any one navigating the river since 1888. Witness states that he never knew that boat to go above the mouth of the Cimarron. He states that the size of the boat was about forty foot long and ten or twelve feet wide, and was taken down the river by Poole. Witness states that at the time he saw the Ortner boat she was empty. He also states that he has never known of any boats running up and down the river, the only boats that he knows of were ferry boats crossing backwards and forwards ferrying people across. Witness states that a Mr. Finley used to buy walnut

logs and run them down the river and put them up the
520 mouth of the Cimarron two or three miles. He did this
in time of high water. In order to get these logs floated
down Flaney put a man behind them with skiffs to keep them
rolled off of sand-bars, even in time of high water it was
necessary to do this on account of the bars. The logs would
lodge against sand-bars and little islands in the river and
would have to be pushed off again. Witness states that he has
seen the river at its low stage and at ordinary low water. He
states that he does not think it is possible to run a boat on the
river in time of low water, and ordinary low water, nor would
it be possible to float logs down the river in ordinary low
water. He also states that the channel of the river is form-
ing sand beds continually in time of ordinary low water, as
well as in high water, and in flood time. In low water, how-
ever, they do not change from one bank to another.

Cross Examination

By Mr. Freeling:

Witness states that he lives about eighteen miles west of
Tulsa, a mile from the river, and that the river at that point
is nearly half a mile wide from bank to bank. When the river
is up it covers the entire space, but when it is low it does not
cover more than probably one hundred yards and fifty yards
in places. At the present moment witness states there are
two channels, each one of them probably one hundred yards
wide. He states that the river at Tulsa is not as wide as at
the point where he lives. He states that he worked on several
ferry boats; one owned by Mr. Hunt, one by Mr. Ackley, one
by Henry Anderson, and several others. These boats were of
different sizes, from twelve feet wide to thirty-five or forty
feet long and drew about eight or ten inches loaded. These
boats hauled corn, cotton, and people going backward and far-
ward to town across the river with their loaded wagons and
teams. These boats were generally propelled with a pole;
some used a wire which had to be loosened up once in
521 awhile. These wires were stretched across the river
and run by pulleys on top [fo] the boat. In propelling
the boat with poles, the poles would be put out in the water on
the bottom of the river and pushed against. Witness states
that he recalls that once in awhile the water would be deep that
they could not reach the bottom with a sixteen or eighteen foot
pole; five or six feet of the pole, however, would be above the
water in poling. The times that the bottom of the river could
not be reached with a pole were at the time of a big flood or
rise in the river. At present in times of high water the wire
could be used but when he worked on the river there were no

wires. Witness states that the rises in the river were generally looked for in May or June but sometimes they would not come. They were generally looked for at that time as the snow generally melted in the mountains then and there was more rain about that time of year than in other months. Witness states that he attributed the rise in the river to rain between Tulsa and the mountains, also by the melting snow in the mountains. He states that at the time of the big rise he has seen the water seven or eight feet deep, but it may have been deeper as he has never measured it, and at the time the river would be from one bank to the other. He has also seen the river go over the low banks. He states that when the river was bank full, that would be an ordinary rise, and it would be mighty difficult to cross it at that time with a pole; at present they run across on a wire stretched across. Witness states that the difficulty in using a pole would be because of the swiftness of the current; also the depth of the water. Witness again states that the boat could have gone down the river in high water, and that in right high water a steamboat could probably go down. He also states that the John Ortner boat was 35 or 40 feet long and ten or twelve feet wide, and that he has seen it once. Witness states that this boat may have made other trips too; he only knows of its making one trip. He also states that he does not know that Ortner used the boat for hauling commodities up and down the river. At the

522 time he saw the boat it was about eighty rods up Cimarron river, at which point it was sold to Mr. Poole. At the time, Mr. Ortner stated he had come from Cleveland, which is eighteen or twenty miles up the Arkansas river from where he saw the boat. Witness states that he got acquainted with a man floating logs down the river in 1888, and it was in the month of June or July that he observed him, and there was a big rise in the river. These logs that were being floated were of pretty good size, probably from eighteen inches to two or three feet. Those logs at the time he saw them were right opposite the mouth of the Cimarron. Witness again states that a man in a skiff was there for the purpose of punching the logs off the bars. The man would get out of the skiff and roll the logs off the bars with a pole; there were probably two or three men together. Witness states that he never lived on any other river but the Arkansas and does not know what occurs on other rivers. At the time he observed these logs they were being rolled off a bar out in the river, but he did not observe how far they were floated after they were gotten off the bar. He saw them float probably half a mile.

Redirect Examination

By Mr. Fain:

Witness states that at the time he saw the Ortner boat at the mouth of the Cimarron there was probably a four foot rise in the river, and after it was sold to Mr. Poole he never saw any more of it.

Recross Examination

By Mr. Freeling:

Witness states that at the time Mr. Ortner had the boat at the mouth of the Cimarron there was about a four foot rise, and that he would call that ordinary high water.

523 A. R. MORGAN, Sapulpa, Oklahoma, testified as a witness on behalf of the Government, on direct examination by

Mr. Fain:

Witness states that he has lived in Oklahoma and Indian Territory since 1891, and that he has been along the Arkansas river and is acquainted with what is known as "Turkey Island," in controversy in this suit. The first time he saw the island was in March, 1887, at which time he was coming down through the Osage Nation from Kansas. Witness states that he had come down into the Indian country to work on a cattle ranch and that there was a man by the name of Farley with him at the time, and that he crossed the river about where the island is located. He observed that there was a channel on both sides of the island; these channels he crossed. He also crossed on to the island from the north going south. The water in the north channel was up to the horses bellies, and the ponies they were riding were about fourteen and one-half hands high. In the south channel the horses swam across, the south channel being much deeper than the north channel. As witness recollects the south channel was about the same width as the north channel but there was lots more water in it, and his partner nearly got drowned in the south channel, which was the main channel around the island at that time.

Cross Examination

By Mr. Freeling:

Witness states that it was in March, 1887, that he crossed the north and south channels, and Turkey Island, and that he has been acquainted with the river ever since. He was at the same place in 1890, and nearly every year since then. In 1890 there was very little water in the river owing to the fact that it was the Fall of the year, the channel, however, was

deeper on the north side than it was on the south side. When he crossed the north channel in 1887, witness states the channel was near a [quarter] of a mile with the sand-bars and all, and the south channel not only was wide but no sand-
 524 bars exposed. At the time the south channel was the main channel and ran from the bank of the island to the bank of the mainland. Witness states that the river has sand-bars in it, which occurs frequently, and unexpectedly; after a flood a sand-bar would occur where the channel was before the flood. Witness states that there was a wide expanse of sand before he got to the water on the north side, then the river ran right up to the island—there were no sand-bars in it where the water was running that were exposed, the river being up, and they rode their horses on to the island. As he stated, they were coming down into the Indian country looking for a job on a cattle ranch, and the place that they crossed the river was on the trail that they were on, running right through the island. Witness states that Turkey Island was quite a good island, the largest he ever saw in the river. While he did not examine the island, witness states that it was a long one, and big. He states that the bank of the south shore on the island, as they went into the river in the south channel, was squared off. The water was washing right out against the bank, and during the time of high water on the Arkansas River it always washed it out square where it goes against the bank—the bank falls off into the river. Witness states that the north bank of the island, and the south bank were similar because the water was running against the island on the north side and on the south side, and the sand was out nearly square. He states that the south channel was probably three hundred yards wide, and the north channel was a quarter of a mile or more. Witness states that the soil on the island was red sand except on the top which was solid, and vegetation grew on it. Witness states that the surface of the island is up and down—wavy and undulating, and that he did not notice any slough in the center. There were willow trees and some cottonwood scattered all over the island, and he states there might have been a lot of other timber but he was not noticing the timber at the time.

525 Witness states that in one of the valleys it looked like the water had been up over it and washed the waves in it. Witness again states, in 1890, when he was there, the water was down but at the time he crossed it before they were warned by the cowboys not to cross it as it was dangerous. Witness states that at the different times that he has seen the river

a the island he had been there in the oil business as a contractor. Witness states that he is connected with the Alma Company at present, operating around Sapulpa and Tulsa. He also states that he has never seen the island when the river was at an exceedingly high stage, and while he has never seen it he believes from the looks of the island that it had overflowed. He states that his reason for thinking that the island had been overflowed was because it was wavy like the river leaves sand-bars in other rivers which he has seen overflowed, but that it might have been caused by the wind. In later years, witness states, that he has [spend] on different parts of the island, he has found it reasonably smooth, with heavy grass and weeds on it, and that it was undulating. He also states that there were logs on both edges of the island. Witness states that there is a small island at the north end of Turkey Island, the soil of which is more sandy than the big island. He states that the small island has the same character of vegetation as below, though it is newer. Witness states the largest trees that he observed on the island in 1887, as he remembers, were twenty or thirty feet tall.

Redirect Examination

By Mr. Fain:

Witness states that in 1887 the moment their horses landed in the south channel they commenced to swim, and [the] swam something like three hundred yards clear across.

J. J. HARMON, Muskogee, Oklahoma, testified as a witness on behalf of the Government, on direct examination by Mr. Kearful, as follows:

526 Witness states that he is fifty-seven years old, and that he is a pilot on the hydraulic barge at Fort Gibson on the Grand. He states that Fort Gibson is about two and one-half or three miles above the mouth of the Grand river. Witness states that he is acquainted with the boat "City of Muskogee," which is at its home port—Newport, Arkansas. He states that his boat was built at Jeffersonville, Indiana, in 1908, taken to Cincinnati and loaded with merchandise, and was brought to Muskogee just opposite the mouth of Grand river. Muskogee lies about four miles from the river and the Grand empties into the Arkansas right opposite Muskogee. Witness states that the Commercial Club from Muskogee had this boat built and brought there, and that Captain Downs of Little Rock piloted it part of the way, but they had different pilots on the route. Witness states that after the boat arrived a Muskogee, Dr. L. W. Bennett and associates bought

it and had it for about a month when he bought it. He states that the size of the boat was one hundred and thirty-five feet long and twenty eight feet wide, drawing about sixteen inches light. Witness states that the boat went up the Arkansas to Verdigris about half a mile above the mouth of the Grand. When it came into his possession witness gave an excursion and ran up the Verdigris about three miles during ordinary rise of water—five or six foot rise. Witness states that the river at that point makes a rise of from thirty-five to forty feet. He states that the character of the bed of the Grand river as compared to the bed of the Arkansas is that the former has a gravel bed and the latter a sandy bed, the average width of the Grand being about six hundred feet, whereas the Arkansas at Hyde Park is possibly two thousand feet. With reference to the steady flow of water, witness states that the Grand has probably from six to eight times as much water in low water season as the Arkansas. Witness states that the city of Muscogee gets its water supply from the Grand river

527 through a tunnel under the Arkansas river, and that no water is taken from the Arkansas river. He states that he sold "The City of Muscogee" to the Inland Packing Company of Newport and that he took it down and delivered it to them at Rosedale on the Mississippi river. From the time he got the "City of Muscogee" until it was sold witness converted it into, and used it, as a hydraulic dredge. He states that he did not use it for commerce up and down the Arkansas but it was used for that purpose prior to the time he acquired it. Witness states that he is acquainted with the character of the Arkansas river above the Grand, and the Verdigris, as far up as Tulsa, having crossed it at Osage, and traveled on both sides by train as far as the mouth of the Cimarron on the A. V. & W., and on the "Katy" as far up as the Osage. These observations extended over a period of [two] years and during that time witness states that he never saw any commerce being conducted on the river above the Grand. Witness states that the contract price of the "City of Muscogee" was \$13,000, and that he paid \$8,000 for it. He states that the plan of the Commercial Club of Muscogee in purchasing the boat was to demonstrate the navigability of the Arkansas up to Muscogee, and to affect freight rates. It had the effect of reducing the freight rates quite materially. Witness states they got Muscogee a better differential than they had, about seven to eight cents a hundred, on the different commodities. He also states that he piloted the boat. "The Mary D" for about three years before that and got some concessions in freight rates by operating that boat up to the Grand River—the freight rates on nails being reduced from 52¢ to 41¢. Wit-

ness states that Tulsa gets some benefit on account of the differential rate but not quite as much as Muscogee. He also states that since the "City of Muscogee" has been taken away the rates have been very materially raised and they do not get the benefit of the differential now that they did before. Witness thinks that the raise is from seven to eight cents. He

528 took the matter up with the Commercial Club and Traffic Bureau at Muscogee, and the latter Bureau made the statement that after the boat had gone, the raise of rates the first year aggregated \$150,000. Witness states that the boat has been gone for about two years. He also states that he has not seen any boats on the river since the "City of Muscogee" left, but of course he does not refer to skiffs. The only boat that has been on the river was a boat that came up from Pine Bluff, or from Little Rock, last Spring, to get some barges, but he did not see it. Witness states that Ernest Cook of Muscogee attempted to navigate the river above the Grand with the "Carrie Clyde." Witness states that he visited the boat when it was below the mouth of the Grand about two miles, after which it was taken up the river, and got on a sand-bar where it still is. He states that the "Carrie Clyde" was not quite so large as the "City of Muscogee;" he judged it to be about seventy-five feet long and probably sixteen feet wide, or about half as large. He states that Cook got about four miles above the mouth of the Grand. Witness states that this is the only attempt to navigate the river above the Grand and resulted in burying the boat in the sand.

Cross-Examination

By Mr. Freeling:

Witness states that the "City of Muscogee" was purchased in 1908 from Howard Bros., of Jeffersonville, Indiana, where it was built. The boat arrived in Muscogee with a cargo from Cincinnati consisting of hardware and implements. In making this trip the course would be down the Mississippi to Rose-dale, and on the Mississippi and the Arkansas to Muscogee. Witness states that the boat loaded would draw about four feet but at the time she brought her cargo to Muscogee it was probably drawing three and one-half feet. About one hundred and twenty to one hundred and forty miles was made from Fort Smith in Oklahoma consuming a day and part of a day in making the trip. This trip was made in July and they had some trouble with low water. Witness states that in the year 1915 there was plenty of water all the time but that other years there may be from four to six months of what is term-

ed low water that would be very difficult to navigate.

529 Ordinarily witness states he looks for a little rise in the Arkansas below the Grand about March, which lasts until about the last of July. Their low water period on the Arkansas runs from the last of July until September, and possibly October. Witness states that he figures that there are about nine months of the year that the Arkansas would be navigable from Muscogee on, for light boats. He again states that at the time he took the boat up the Verdigris a few miles in July, 1909, there was a rise of possibly four feet on the river, which was considered an ordinary raise on the Grand. Witness again states that the operations of the boat "city of Muscogee" influenced the freight rates of the city about seven or eight cents a hundred on the different commodities. He also states that prior to the time that he piloted "The Mary D" between Fort Smith and Muscogee there had been no navigation on the river above Webbers Falls and he states that "The Mary D" was used to haul all kinds of freight up and down the river, principally up. Witness states that besides having seen the "City of Muscogee" and operated "The Mary D" he knows of the "Carrie Clyde" but that he has never known of any boat going to Tulsa. He also states that the cause of the decrease in freight rates at Tulsa was on account of the differential at Muscogee when the navigability of the river was demonstrated, the Muscogee was used as a basic point that influenced the freight rates throughout the entire State, and Tulsa got the benefit of the decrease in freight rates. Witness states that he never went any further up the river than the mouth of the Grand river with the "Muscogee." His recollection is that the "Carrie Clyde" went from four to seven miles above the mouth of the Grand but he does not recall that it went to Choskey. He further states that the "Carrie Clyde" was stranded on a bar some where between four and seven miles above the mouth of the Grand. Witness also states that he was told that the "Carrie Clyde" was attempting to operate between Choskey and Muscogee,

530 a distance of about fourteen miles, as there were no railroad facilities when she went on the bar. Witness states that he has observed quite a number of logs floated down the Arkansas from the Grand, but that he has never observed any rafts floating from above the mouth of the Grand. He has, however, seen a lot of drift.

Redirect Examination

By Mr. Kearful:

Witness states that the reason that he did not go up to Tulsa with his boat was because there wasn't water enough to

make it safe to get there. He states that while there was plenty of business, and one might catch high water enough to go up there the probabilities are that you would be held there, as the duration of the raises in the water is not very long, the rises in the river being dependent upon the rains up and down the stream.

Recross Examination

By Mr. Freeling:

Witness states that a light draft boat could [possible] go up to Tulsa on high water but that the river is very wide above the mouth of the Grand and has a different formation, and spreads out over more territory than below. He states that there are several bridges along the river at that point, and that in the construction of the Frisco bridge below the mouth of the Grand, and the Interurban bridge, they had to get permission from the United States Government to build; as for the other bridges he cannot state whether permission was gotten for their construction. He further states that permission to build the Frisco bridge was gotten through the War Department, as they had charge of the navigability of the stream. He states that they took the proposition up with the War Department, asking permission to build the bridge. They built the bridge without a draw and had to give bond in the sum of \$100,000 in case it was demanded that a draw be put in according to the specifications of the War Department. As to the interurban bridge, witness does not believe a bond was required as it was built a little higher than 531 the Frisco bridge. He states that the Interurban was within four hundred feet of the Frisco bridge and that the piers were about fifty-seven feet; the Frisco piers being fifty-three feet. He states that in ordinary water a bridge fifty-seven feet high would permit light traffic to pass under and that on a four or five foot rise he could pass under it with the "City of Muscogee." In the case of the Frisco bridge he had to take down the smoke-stack when he passed under. The other bridge he passed under when he went out with the boat. Witness states that he understands that the specifications of the War Department require one to put in a draw but he does not recollect anything in the specifications requiring lights on the bridge.

Redirect Examination

By Mr. Keerful:

Witness states that lights are not maintained on any of bridges referred to and that when he took the "City of Muscogee" out finally it was not loaded but light. He states that it is an expensive proposition to put in a draw after a bridge

is built, as a new pier has to be put in, and also a new span. He states that the reason they gave bond to put in a draw was that there was no navigation on the river in 1901, when the Frisco bridge was built. Later on "The Mary D" was gotten there but she could always get under the bridge. Witness states that proceedings were instituted by the citizens of the City of Muscogee for the purpose of having the bridges raised or draws put in. This occurred in 1907. Mr. Dixon, Superintendent and General Manager of the Frisco Railroad, talked to him about the advisability of raising their bridge fourteen feet but nothing was ever done in the matter. Witness states that the matter was taken up through the War Department and the railroad made a survey for raising up the bridge or putting in a draw, resulting in some agreement with the railroad to run a spar down the river from the bridge and make the landing below the bridge. Witness states that the bridges referred to by him are all below the mouth of the Grand river.

Recross Examination

By Mr. Freeling:

Witness states that the Government made an order that the Frisco bridge be raised and a draw put in, and that they figured on the advisability of raising it fourteen feet or putting in a draw. He states that he was consulted as to whether that would be safe or not. He states that the old boats passed under the bridge dependent upon the stage of the water. He also states that he has seen quite a number of boats around Muscogee, these boats ranging in size from sixteen to twenty feet and are used as pleasure boats by the people to run up and down the river. Sometimes they go down as far as Fort Smith and at other times up the Grand river. He states that these boats go up the Grand about as far as Lowell, Kansas, and a flat bottom boat about twenty-five feet long and eight feet wide called "The Mary D" does a little excursion business around there and makes a trip once in awhile as far as Fort Smith. Witness states that he does not think the boats go up in the direction of Tulsa as there is too much sand to make navigation safe up there but that they do go from the Grand into Kansas and down the other way to Fort Smith at times. Witness states this boat has no difficulty in passing under the bridges as it is not more than twelve feet over all in height.

P. R. VAN FRANK, JR., Little Rock, Arkansas, testified as a witness on behalf of the Government, on direct examination by Mr. Kearful, as follows:

Witness states that he is fifty years old and his profession is civil engineer, the greater part of his life being spent on river work. He states that he is a graduate of the Missouri School of Mines, and is fairly well acquainted with the Arkansas river. He states that he has been directly connected with the river since 1891, save about two years and one-half. At present he is principal assistant civil engineer to the army officer in charge of Little Rock District, and
533 he first became connected with the Engineers office in 1891. In the Fall of 1893 witness was in field work on the Arkansas river, at St. Francis river and White river. In the Fall of 1893 he went into the Little Rock office. His duties as principal assistant to the officer in charge consisted in the preparation of details of plants, supervision of examinations, approving of reports, and other work. From August, 1907, to May, 1909, he was engaged on river work on the Mississippi river. Witness states that he examined the Arkansas, the White Current, Cast, and St. Francis river with a view to determining the capacity of the streams and their worthiness for improvement, or for use, in navigation. At the time witness went into the Little Rock office in 1891, Captain H. S. Taber was the officer in charge. From 1894 to 1898 Lieutenant William L. Sibert, now General Sibert, was in charge. Witness states that he collaborated with Captain Sibert in his report dated April 21, 1898, to the Chief of Engineers, upon the question as to whether or not the water supply in the navigable portion of the Arkansas river had been diminished by irrigation works in the upper part of the stream. This report was made on the complaint of T. J. Smith at Bentley. The report referred to, witness states, is marked "Plaintiff's Exhibit 65." Witness states that the examination made as a basis for the report was very thoroughly done.

In the report occur the following statements:

"This comparison of gauge readings does not show that the river stages are getting lower," and again, referring to rain fall records "rainfalls at Wichita and points further up the valley do not appear to have any effect on the river at Little Rock unless accompanied by rains at points lower down, while rainfalls in the Verdigris and Grand (Neosho) River Valleys have decided effects and the quantity of water carried past Little Rock appears to depend almost entirely upon the amount of rain falling east and southeast of Wichita;" and again

“summing up the matter, no constant diminution of
 534 the water supply in the navigable part of the Arkansas river is shown by the records so far as I can see. Tradition and history seems to establish the fact that the navigable depth of the Arkansas river was so small at times prior to 1860 as it has been since. There is nothing in the records of the last twenty years to show that these periods of extreme low water are of more frequent occurrence since 1888 than in the ten years prior to 1888.” I will ask you to state whether since that report was made you have made any examination for the purpose of ascertaining whether or not there has been any change in the Arkansas river since that report was made?

A. I have.

Q. State whether or not there has been any change in the Arkansas river since the date of that report? If so, what?

A. There is nothing that you can determine one way or the other in the way of change.

Q. Does that mean that the river is substantially the same now as it was then? A. Same now as it was then.

Witness states that he is familiar with Exhibit 49, being House document No. 50, House of Representatives, 56th Congress, Second Session, containing the report of the Board of Engineers made June 8, 1899, signed by Amos Stickney, Lieutenant Colonel Engineers, and that he compiled under the direction of Captain McGregor, District Officer at Little Rock at that time, a good many statistics used by the Board. Witness states that he accompanied the Board on two trips on the Arkansas river from Wichita all the way through to the mouth, and gave assistance to the Board in making measurements and taking observations.

Q. In the report referred to is the following statement: “Fort Gibson on the Grand river, two miles above its mouth and 463 miles from the mouth of the Arkansas river, has always been considered the head of river navigation;” and again, “as before stated the mouth of the Grand river has always been considered the head of navigation on the Arkansas river. Attempts at navigation above that point
 535 have been of rare occurrence and soon abandoned.

The river between Wichita and the Grand is crossed by nineteen fixed bridges and by two fixed dams.” Please state, if you know, who furnished to the board the data upon which those statement were founded?

A. A portion of that was furnished to the board from Little Rock and a portion of it the board gathered on their trip.

Q. You were with the Board on that trip, were you?

A. Yes, sir.

Q. In gathering that information? A. Yes, sir.

Q. And what particular person in the office furnished the data to the board? A. I did. Let me amend that last thing—that last answer, by saying through the district officer.

Witness states that he is familiar with complainant's Exhibit 59, being House document No. 206, 61st Congress, second session, which contains a report on the Arkansas river from Tulsa to Fort Smith, dated June 19, 1909, signed by M. L. Walker, Major, Corps Engineers. He states that Major Walker was District Engineer officer at Little Rock and Memphis at that time and that he with the assistance of William Perkin, the Second Assistant Engineer in the District collaborated with Major Walker in the preparation of the report. Parkin, witness states, has been connected with the Little Rock office since 1892, and some time prior to that. Witness states that he drew up the draft of the report referred to and that the report according to his recollection was made substantially according to his draft.

Q. In that report we find the following statement: "The steep slope, the small low water flow and the shifting sands and gravel in the bed of the river preclude any possibility of improving it by means of regulation works so as to afford a channel that would be of any worth for navigation purposes," that referring to the reach from Tulsa to the mouth of Grand river, sixty-five miles. And, again: The
536 mouth of Grand river has always been considered as the head of navigation on the Arkansas river, and if there has ever been any commercial navigation of any sort above that point this office has no information of it." And, again: "In view of the fore-going, and in compliance with the law directing that an opinion as to the worthiness of an improvement be expressed, I must report that it is my opinion that the Arkansas river between Tulsa and the mouth of Grand river is not worthy of improvement." Please state whether or not those statements were in the draft of the report which you prepared for Major Walker? A. They were.

Witness states that the elements taken into consideration in determining the capacity of a stream for use in navigation, and with a view to its improvements for that purpose, are the volume of flow, the nature of the bed, the general slope of the stream and the general nature of obstructions in the channel. Witness states that in the case of a stream

where the inhabitants of the country have made repeated attempt to use the stream for navigation purposes the actual use that has been made of the stream is considered as an element in determining its navigable capacity in fact. He states that the nature of the bed of the Arkansas River above the Grand is shifting sand which makes the usefulness of the channel of the river very uncertain. Witness states that in his examination, the width between the bank in Oklahoma above the mouth of the Grand was taken into consideration and studied. Witness states that the width of the river at the mouth of Salt Fort is about nine hundred feet, about twelve hundred feet down to Cimarron, and eighteen hundred feet average width from there down to the mouth of the Grand. He states that the average slope of the river from Walnut Creek to Salt Fort two and six tenths feet per mile; from Salt Fork to Cimarron the average slope is two and four tenths per mile; from Cimarron to Grand the average slope is two and one tenth per mile. From the mouth of the Grand down for the next thirty-seven miles the slope is just about half what it is from there to Cimarron, the break in the slope at the mouth of the Grand being abrupt. Witness

537 states that according to his recollection there is very little difference in the width between banks above the mouth of the Grand and below the mouth of the Grand to Webbers Falls. Witness refreshes his recollection from the executive document and states that the width from Grand to Canadian averages about one-quarter less than it does from Cimarron to Grand, and that Canadian is six miles below Webbers Falls. Referring to Exhibit 67, which is a profile of the Arkansas river from the Cimarron down to Little Rock, being an office record showing the slope of the stream, witness states that it shows the point at which the slope makes an abrupt change just below the mouth of the Grand river.

This Exhibit No. 67 was offered in evidence at this point. The nature of the banks of the Arkansas river in Oklahoma above the mouth of the Grand witness states he considers to be generally fairly stable; that is, there is not the extent of caving in that takes place on the lower Arkansas, and is an element to be considered. In the lowest section there are no rocky places at all, in the upper section above the mouth of the Grand witness states that at least one-third of the river touched rock, or close to it. He also states that the obstruction to overcome in the Arkansas river from Fort Smith

to Arkansas City is shoal water, and in connection with shallow water, shifting sand-bars, are a very great obstruction. Witness states that the principal element in determining as to the navigable capacity of a stream is the volume of flow and that he has made a special examination of the Arkansas river to determine the volume of flow as a basis for the different reports. The most important stage of the volume of flow is at low water season. In this connection, extreme low water flow is a controlling element as to whether you can make a channel of navigation depth throughout the year. The ordinary flow gives information as to the length of time you can make a navigation depth if you can't make it throughout the year. The extreme low water at Tulsa measured in cubic feet per second, witness states, is between one hundred
538 and seventy-five and one hundred and eighty feet per second, surface flow, and by that he means to exclude water running under the sand. He also states that the extreme low water flow in the Arkansas river above the mouth of the Verdigris is practically the same as at Tulsa, perhaps ten or fifteen cubic feet per second more. The extreme low water flow of the Verdigris is about fifteen cubic feet per second, and the extreme low water flow of the Grand, or Neosho, is three hundred and thirty or three hundred and fifty. The extreme low water flow of the Arkansas below Grand river is approximately five hundred cubic feet per second. The ordinary low water flow at Tulsa witness states is three hundred and fifty cu. ft. per second so far as they have measured, and that of the Arkansas above the mouth of the Verdigris would be very little different from that at Tulsa. The ordinary low waterflow of the Verdigris is about one hundred and twenty five and of the Grand where it flows into the Arkansas, in the neighborhood of five hundred, and that to five hundred and fifty, and the extreme is close to a thousand, or just about double the minimum. Witness states that the difference in the character of the Arkansas river as compared to Grand river is that the Grand is more in the nature of a mountainous stream—rocky banks, mud banks gravel bottom and rock bottom, and the Arkansas sandy bottom. With reference to width between banks, the Arkansas will average from two to two and one-half times the width of the Grand; and with reference to steady water flow, the Grand is much more steady. With reference to the amount of discharge of the Arkansas above the Verdigris and the discharge of the Grand where it flows into the Arkansas, witness states that in extreme low water conditions the Grand will flow a little over two or

three times what the Arkansas does. In ordinary conditions the ratio would be about five to four, that is, if the Grand was running five hundred or five hundred and fifty cubic feet a second he would expect to find three hundred and seventy-five to four hundred cubic feet per second coming out of the upper Arkansas when both are in the same climate conditions.

539 He states that the Verdigris under ordinary conditions only puts in one hundred to one hundred and twenty-five, the volume of water in the Verdigris usually coming in high water. With reference to steady water flow the Grand has a steadier flow than the Verdigris in the dry season. Witness states that at no time during his incumbency at the Little Rock office did he find any trade or travel in the Arkansas river above the mouth of the Grand river conducted in the customary modes of trade and travel on water and that he does not think it feasible as an engineering proposition to make a channel in the Arkansas river above the mouth of the Grand that would be of any worth for navigation purposes by contracting works. As to the feasibility of constructing fixed dams for the purpose of canalizing the Arkansas river above the Grand, witness states that it is practical to do so but movable dams would be much the better, for the reason that when the river is up you would lower the dams and let the river have a free current through the pool to sweep the sands on down. In the case of a fixed dam the pool would soon silt up. I mean, you would have a mass of mud and sand from time to time. In order to make a fixed dam feasible it would require continual dredging operations to lock to lock practically after every run out or freshet in the river. These freshets, witness states, are uncertain both as to extent and duration, and occur anywhere from January to the last of the year but as a general statement he would look for about two each year; one at the setting in of the Spring rains, and another about the middle of the summer, varying about four months from any fixed date. Witness states that the difficulty in making contraction works for contracting the channel of the Arkansas river above the Grand is lack of water and seep slope. The slope between the mouth of the Grand and Tulsa of two and one-tenth per mile being regarded as steep, though there are steeper slopes on navigated rivers. Witness states, however, that where there are steeper slopes on navigated rivers the character of the bed is unlike that which he has described.

540 The volume of flow is also different. The difficulty in contraction works along the shallow places in the Arkansas river with reference to the channel is that

after a rise of any considerable moment the whole bed made by contraction works would be filled with sand, then when the river falls from the high stage to its lower stage it has to make a new channel through the newer filled up bed. While if the contraction works were built to control that water as it falls, when the water gets down to its point of minimum contraction, or if the contraction works are extended to the minimum, that channel is so crooked and so winding that it could not be used any way and there is no material increase in depth. He states that the popular theory of contraction works is that you narrow your bed and increase your velocity and by the result secured you wash out the shore. The case of a sandy bed, such as under consideration, if you increase your velocity you increase the movement of your sand and when the sand begins to move it moves right down the river until it gets to a place where it can spread out and your velocity is reduced to that point it does not move the sand; but if your contract works at one shoal you simply build up another shoal below that by removal of the bar. If the river is contracted throughout they occur practically the same as they did before, one after another coming from above. There will be more of them at the same depth; less water in the pool. You will have more shoals and have the same water; you will have more pools but they will be shallower and the channel will be more crooked. Witness states that he and Major Walker together made the calculation in the report as to the amount of money it would cost to make moveable dams from the mouth of Grand river to Tulsa. The report states that the system of locks and dams made by moveable dams with eight feet lift is the most practicable method for improving the river, and the first cost was given as \$10,044,000, and an annual maintenance of \$541,880. This, witness believes could be done as he believes there is enough water for movable dams and that is about as close an estimate as you could make on that kind of work.

541 Witness states that the Tulsa Commercial Club, or the Tulsa Board of Trade, were especially interested in that project and were the prime movers. On the face of the interviews and correspondence, witness took it that they wanted a waterway from Tulsa south, and the [organization] gave them a lot of commercial statistics of available freight for the river.

Beginning at Fort Smith, and going up the river the first principal tributary, excluding the Poteau, is the Canadian, the

Poteau being right at Fort Smith, and is a mountain stream until it hits the Arkansas valley when it partakes a good deal of the nature of an alluvial stream with good firm mud banks all the time. This stream was considered navigable by the Little Rock office to the State line where it crosses—about sixty-five miles from the mouth, and flowing through the Indian country. Before reaching the Canadian there is Camp Creek and Slaisaw, the former being a little narrow creek, and the latter not amounting to much. The Canadian, witness states, is one mass of sand—banks, bottom and all, and the Little Rock office was not called upon to make any statement regarding it. His opinion, however, is that the Canadian can be used for a short while each year about fifteen miles up, and that the back water from the Arkansas lets you use the Canadian up that distance. The next principal tributary to the Arkansas that amounts to anything is the Illinois, which is a little hill stream used in the early days, about two or three miles from the mouth, for navigation. The next tributary is the Grand used for navigation to Fort Gibson, about two miles and a half up the river. Witness states that the Grand was used in the early days considerably further up, fifteen or twenty miles, perhaps. The Verdigris enters the Arkansas about three-quarters of a mile above the Grand. In the early days that stream was used up some ten or twelve miles but is not what might be called a high water creek. Witness states that he has had practical experience in boating on the Arkansas and other rivers of the same character off and on ever since he has been in the district, having spent a month or two at a time on them.

542 Witness states that he is acquainted with the difficulties encountered in piloting a boat along a stream of the character and bed of the Arkansas. He states that the principal difficulty is in [determining] the channel, that [is] is all a matter of eye judgment. For instance, an experienced pilot says he reads the water, or the appearance of the water's surface; he makes a guess as to where it is deep water or shallow water and from his judgment of the water's surface he tries to follow the deepest line. This line runs from bank to bank. The river will bend to the left and then to the right and the deepest water in a bed of that kind, consisting of [sane] plays out, because the deepest water runs to the bank in the bend. When you leave one bend to go over to the opposite shore, the river is wider, and being wider, gets shallower, and it is on these crossings there is difficulty in determining where the line of deepest water is because there is no guide at all except from being able to read the water by experience.

Witness states that it would be a physical impossibility to have a straightway bend because the water would not run in a straight line, the reason for that being the difference in the hardness at the bottom which is one thing that causes a little obstruction, or something of some nature that makes one continual winding stream.

Cross-Examination

By Mr. Freeling:

Witness states that he began his service in the Little Rock District in '91 under Captain H. S. Taber of the Engineer Corps, who was district officer in charge for the War department. He states that he continued in office there until 1907. Witness states that he made himself familiar with the records of the office after he took up his work. He states that the Little Rock office was established in 1881. Prior to that time the jurisdiction of the Arkansas river was under two offices—one of which was in Saint Louis, and the other he does not know where. The Saint Louis office had charge of what they called "The Permanent Improvement Works", and the other office had charge of removing obstructions, etc., in 543 1881, these two duties were consolidated and put under the Little Rock office. Witness also states that they were constantly trying to improve the navigability of the river from the Little Rock office after 1881. Referring to the preparation of the report of Captain McGregor, called "The Annual report for the Chief of Engineers for 1900", witness states that this report consists of two reports—one report being his own to Captain McGregor who makes a summary of that report in his report, based upon the data which the force has gathered. Witness states that the compilation of commercial statistics which is included in the McGregor report is part of his duty except the financial statement. He states that in the Chief Engineer's statement of the report the project of improving the river from the mouth as far as Wichita, Kansas, a distance of seven hundred and seventy-one miles is considered. Witness states that Captain Tabor in his part of the report states that the river can for all purposes of law be rated as navigable to Wichita, Kansas. He further states that the office at Little Rock does not act on any report. The reports are made to the Chief Engineer; he then submits them to Congress which acts upon them and formulates the project. This project, witness states, was formulated by Congress who acted upon the data furnished by the Engineers of the War Department made from

appropriations in accordance therewith. These appropriations were for the purpose of improving the navigability of the river. Witness states that his department submitted annual reports to Congress each year. These reports were made by the district officer and submitted to the Chief Engineer who in turn formulate and make another report which goes to the Secretary of War, who forwards it to Congress. Witness states that there has been a report every year on the subject of the Arkansas river, which has been under the jurisdiction of the War Department, and the War Department has made its report to Congress and Congress appropriated money from time to time to improve the navigability of the stream.

544 Witness states that in 1897 or '98 he did work on a dredge-boat, the name of which was the "Van Frank," named after him. This boat was about thirty-four feet wide and one hundred and ten feet long. He states that they started at Prices Island about twelve miles above Fort Smith and worked very largely at that point after which they took her down and worked about twelve or fourteen miles above Little Rock. Witness states the farthest north he worked on the dredge was two miles above Redlands, which is about seventy miles south of Muscogee. He states that he has heard that the snag-boat Wichita worked up through the State of Oklahoma under the direction of the War Department, but that was before his time. Witness states that the Department has conducted snag operations from Fort Smith to Fort Gibson on the Grand; also regulation work at Ainsworth, two miles above Redlands, and at Prices Island, twelve miles above Fort Smith. They have also done dredging at Prices Island and quite a series of contraction or regulation works put in within five miles adjacent to Fort Smith up stream. Witness states that the two trips of the Board of Engineers from Wichita to the mouth of the river were made in 1898 or 1899 before the report made under Robert McGregor for 1901. He states that one part of the trip was made in the summer, and one part in the Fall of the year. Witness states that on one trip he accompanied Col. Stickney, Captain Newcomer, and another man whose name he does not recollect. They went to Wichita by rail and made an examination of the river in that vicinity; from there they went in the neighborhood of Oxford and made an examination of the river, and again at Arkansas City, from which point they went to Fort Smith. Witness states that he has never made the trip down the river from Wichita but just looked at it from the banks. He states that he had nothing to do with the approval of the report for 1900 as to the project of removing rock and gravel

by blasting, dredging, and so forth. Referring to that part of the Captain's report stating that a two foot channel could be provided whenever the country warranted it, and the river

can be for all purposes of law rated as navigable to
545 Wichita, Kansas, witness states that there is water enough to make two feet if you put in a canal and make it narrow enough, but he does not, as an engineer, believe that a two foot channel can be provided, nor does he believe that a two foot channel depth could be gotten from Arkansas City south. Witness states that he does not believe that up the river from Muscogee one could get an open dependable channel two feet in depth for four consecutive months in the year. You might, however, as an average, get it for part of April and maybe part of May and probably part of June, but there would be three disconnected parts. Witness states that he is doing work on the river around Shoal Creek, some sixty miles below Fort Smith. Witness states that commerce is being floated on the Arkansas river but none as high up as Fort Smith that he knows of. When he first came into the district, witness states that the "Border City" was operating around Fort Smith, which was followed by a boat called "The George W. Mayo". After that there was a boat called "The Mary D." and after that a boat called the "City of Muscogee," and just about that same time there was another boat called the "Border City." The "Mayo" and the original "Border City" purported to operate between Fort Smith and Fort Gibson. They were making Fort Gibson trips on high water when they had freight, but Webbers Falls was generally about the limit of their trips. These boats conducted a general freight business. Witness again states that by building a series of locks and dams from the mouth of Grand river to Tulsa at the cost given in Major Walker's report, approximately \$10,000,000, the river could be made navigable. Witness explains in detail the building of a series of dams and locks, and states that that method is used on the Allegheny, the Canawba, the Green, the Ohio, the White and the Fox rivers. He states the dams are built across the Fox and Ohio rivers, which are navigable, and that these dams were put in so that larger and deeper boats could be used on those rivers. Witness states that Major Walker's part of the report was made on June 19, 1909, and left the division office on June 24, 1909.

546 In the annual report under the head of "Commercial Statistics" the following appears: "The steamboats report the river navigable all the year ending June 1, 1899." "Sixteen inches is the shoalest reported between Fort Smith

and Webbers Falls; twenty-four inches between Dardanelle and mouth of river. Navigation was stopped by ice from February 6 to February 19, 1899, both dates inclusive." This, witness states, refers to the Arkansas river below Fort Gibson, but is qualified by the sentence appearing after, which which reads, "No navigation above Webbers Falls that year," which, as he takes it, refers to the mouth of Grand river about thirty-one miles above Webbers Falls. In this report witness states the names of a number of vessels appear that navigated the Arkansas from May 31, 1898, to June 1, 1899, most of which he has heard of. There also appears the articles of commerce carried by these vessels. Witness states that the department has used money for the improvement of the Arkansas river under an appropriation from Congress for the year 1915. This appropriation was made for the Arkansas river in Arkansas and in Oklahoma, but witness states that no money whatever has been expended in the State of Oklahoma. Witness states that in 1914 a general appropriation for the maintenance of river and harbor works was made by Congress, and an allotment to the Arkansas river was made by the Secretary of War who has charge of the navigable streams of the United States. With reference to navigability, witness states the War Department has considered the Arkansas as [an] navigable waterway of the United States.

Redirect Examination

By Mr. Kearful:

Witness stated that he did not intend to include by his last answer the entire Arkansas river from its source to its mouth as being regarded by the War Department as a navigable waterway of the United States. He also states that when he answered that the War Department regarded the Arkansas river as a navigable waterway of the United States he
 547 had in mind a particular portion of the river. Referring to the adopted project on the Arkansas river to which his attention was called on cross-examination, witness states that no part of the appropriations that were available under that project was expended for improvement above the mouth of the Grand since he has been in the district. Witness states that he has seen the "Carrie Clyde" which is a comparatively small boat, about 18x79. This boat, witness states, was originally built as a ferry boat and came around to the Arkansas river to work above Muscogee. He states that he does not recall her draft but that the depth of the hull was three feet, six inches. Referring to the annual report for 1902 on page 1575, giving a list of vessels that navigated the

Arkansas river May 31, 1901, to June 1, 1902, in which is mentioned the "Carrie Clyde", tonnage sixty draft three feet, [jouth] to Coshka, witness states that the note below that item reading "One way trip" means that she came from the mouth of the river up to Coshka and did not make the return trip. Witness states that the effect of the back water from the Grand upon the Arkansas river above the mouth of the Grand depends upon the comparative stages of the river. If the Grand is high and the Arkansas low, the Grand will back up the Arkansas probably thirteen or fourteen miles. If the Arkansas is up at the same time, the back water effect might be up twenty or twenty-one miles. If both streams were at ordinary stage of water there would be very little back water on the Arkansas. Witness states that in the operation of a system of locks and dams between the Grand river and Tulsa, in the case of a fixed dam, the sandy bed of the Arkansas river would always have a tendency to fill the bed with a deposit of sand and silt, and finally result in a series of sandy beds from one dam to the other. With a movable dam you could sweep that out to some extent. In the case of a [moveable] dam, witness states, it might occur after a [frestet] that the locks would be to one side and the channel to another, but that could be corrected, because when you raised
548 your dam you restore your pool, and with the pool restored and with a dredge you can soon make a canal connection between the lock and wherever your channel happens to be. Meanwhile, however, vessels would be delayed until the channel was open. Witness states that in a river rising from low water to higher stage the increase in channel depth is not as much as the increase in water height for the reason that the sand piles up—the bottom of the river goes up as the water goes up. The increased velocity in a rising river sweeps the sand out of the bends and then where it curves across the head of bend or something like that it sweeps the sand out and piles it up and stretches it out on the first bar where the river widens. At the crossings, or if it is in a wide straight reach, it would pile up the same way.

Recross Examination

By Mr. Freeling:

Witness states in 1906 he was associated with Graham D. Pitts, Major, Corps of Engineers, and that Major Pitts based his report on data that he had furnished to him, and on page 447 of Pitts' report, the following appears:

"The original project for removing obstructions in the Arkansas river, Arkansas and Kansas, act of July 3rd,

1832, was to remove snags and rocks. Subsequently this project was enlarged to include removing bars by wing dams and many appropriations were made for this work in combination with other rivers. By the act of March 3rd, 1879, Congress adopted an additional project for the improving of the river between Fort Smith, Arkansas and Wichita, Kansas, by removing the snags and rocks and constructing dams at some of the worst shoals. Later these projects were merged into one, making the project extend from the mouth of the river to Wichita. Under these projects there was expended to June 30, 1902, \$968,256.81."

This, witness states, is the Chief of Engineers part of Major Fitch's part. At this point Mr. Kearful stated the document being in evidence spoke for itself, the Court agreeing.

Appearing in the document is the following: "March 3, 1879, for improving the Arkansas river between Fort Smith, Arkansas, and Wichita, Kansas, \$20,000." This, witness states, is an extract from the wording of the Appropriation Act and is not the part that the Chief of Engineers allotted to the river out of the general appropriation. Witness states that starting in 1879 the appropriations were made for improving the Arkansas river between Fort Smith, Arkansas, and Wichita, Kansas.

Redirect Examination

By Mr. Kearful:

Referring to the appropriations of 1879, 1880 and 1881 for improving the Arkansas river between Fort Smith and Wichita witness states that his recollection is, which is wild guess, that there was somewhere in the neighborhood of six thousand dollars spent in the State of Kansas out of the twenty thousand dollars appropriated in 1879; also there was expended the amount of money necessary to take the Wichita from the mouth of Grand river to Pawnee Agency and back, and that covers all the expenditures above the mouth of the Grand river out of those three appropriations.

CHARLES H. MILLER, Little Rock, Arkansas, testified as a witness on behalf of the Government on direct examination by Mr. Kearful, as follows:

Witness states that he is forty-nine years old and that his profession is civil engineer, which he has been for twenty-seven years, and his experience embraced thirteen years as assistant to the United States Army Engineers, working under the Mississippi river Commission, four years following

that he was located in Pittsburgh with a construction company in general lines of iron building construction, for six years following that he was with the Iron Mountain and Missouri Pacific Railway Company as engineer [fo] river protection and drainage work over the territory traversed by their lines. During the past four years, witness states, he has been president of the Miller & Yerring Company of Little Rock doing general engineering construction work in special lines of river and drainage work. He states that he acquired experience in navigation while he was with the engineering corps.

On a great many occasions it became his duty to actually handle survey boats, and in construction work he handled boats. Witness states that his acquaintance with the Arkansas river began in 1905 when he was with the Missouri Pacific and Iron Mountain Railway Company. He also states that his work has taken him over the Missouri, the Kaw, the White, the Arkansas, the Red, and other similar streams. Witness states that about 1907 he made an examination of the Arkansas river above the mouth of the Grand at Wichita, and also at Oxford, and that during the last month he made an examination of the Arkansas river from Cleveland to Tulsa. Witness states that his work has been largely in the direction of protecting banks [again] caving, in connection with which he has had to use boats to transport construction materials for the work. He states that the elements that are taken into consideration by an engineer in determining the capacity of the stream are the character of the bed or soil through which the river flows; the amount of water flowing therein, and the slope—declivity of the river. Witness states that he is familiar with these elements as shown by the Arkansas river above the Grand and has obtained that information largely from the reports of the Chief of Engineers which he has examined from 1880 to 1914, for that purpose. Witness also states that he has seen the various documents introduced in evidence, including the report of the Board of Engineers in 1900, and the report of Major Walker in 1909. He states that in general the character of the river bed of the Arkansas above the Grand is sandy, and flows through what he calls alluvial formation. In a general way witness states that he is familiar with the height of the banks and the width between banks of the Arkansas river above the Grand at Cleveland, as he measured it, it was in the neighborhood of nine hundred feet; at Tulsa, somewhere in the neighborhood of eleven to twelve hundred feet and down. Just above the mouth of the Grand it is as narrow as about

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eight hundred. Below the mouth of the Grand, witness states, the width between banks [in] somewhat narrower, approximately one-third or one-fourth on a general average than above the mouth of the Grand. He states that from his own measurements, made last month, the relative flow of the Arkansas above the Verdigris is less, as an average, than the Grand where it empties into the Arkansas; that is the Grand river will average a little more, as a rule, than the Arkansas. Witness states that the ordinary low water flow of the Arkansas is somewhere in the neighborhood of three hundred and seventy-five second feet, and the ordinary low water flow of the Grand is nearly five hundred feet. The Verdigris, he states, is very low—less than a hundred feet. Witness states that the river below Fort Smith and between Fort Smith and Little Rock is considerably better so far as navigability is concerned, as the Grand river gives it additional water, and the slope changes perceptibly in the vicinity of the Grand, both features making a better situation as far as navigability is concerned. He states that in making his calculations to ascertain the slope of the river in the section above the Grand, and below the Grand, he has used the data published by the War Department; he has not, however, made any direct measurements himself. The slope above the Grand averages about two and one-tenths; and below the mouth of the Grand about $1 \frac{2}{10}$; at the mouth of the Grand the slope becomes less and from that point there is an abrupt change in the general profile of the river. Witness states that he does not think it is practical at all to contract the wide channel of the Arkansas above Grand river so as to furnish a navigable channel depth. He also states that he does not think that it would be feasible to create a navigable channel in that section by canalization work as there would be no degree of assurance that the channel would be serviceable at all times of the year. He states that it is possible to build those works but the shifting sands in the river would have the channel on one side of the river one time and on the other at another, and a lock may be on a particular side of the river on occasions and you would have to use a dredge in connection with that canalization. As to fixed dams, witness is of the opinion that they are absolutely out of the question. He states that there is a possibility of improving the river by means of moveable dams but you would have to have considerable dredging equipment to maintain a channel all seasons of the year, and there would likely be times during extreme low water that it would be totally impossible to maintain a channel. In its ordinary low stage the chief difficulty encountered in following the deepest water of

the river is the shoal section of the river at the crossings. The moment of the sand is so rapid that these are changing constantly, not having any fixed channel. By crossings, witness states he means the point where the river goes from one bank to the other. The deepest water, witness states, is situated between the crossings in what are termed the pools, and the shoal water is on the crossings which occur from the foot of one pool to the head of another. The pools are generally near the convex side of the bank at a point where they originally follow a bluff or stay for sometime in that particular location. Witness states that he thinks it is a very difficult matter to follow the channel of the deepest water in the Arkansas river above the Grand, and there is no fixed rule by which one can follow these channels at all times—you must read the water, take your chances by guessing at it. Witness states that the latter part of November, 1915, he attempted to float a boat between Cleveland and Tulsa. At that time he took discharge observations for the purpose of determining the amount of water flow. At Cleveland they found approximately twenty-five hundred second feet, or about seven or eight times the low water flow, and about thirteen or fourteen times the minimum water flow, the minimum flow being given with reference to Tulsa which is less than at Cleveland because the Cimarron river comes in between those two points. Witness states that his boat is about sixteen feet long, four feet wide, and drew four and one-half or five inches with the load

553 he had aboard and [dirven] with cars. They also had with them on the trip a skiff sixteen feet long and three feet wide. This boat carried from one to two men. In attempting to navigate the river with these boats, witness states they went aground a number of times, had to get out and push the boat off, wade around, and find water deep enough to get it off. Witness states that he was directing the progress of the boat in which he was and the other boat was being directed by Mr. Van Frank, and that they were not always agreed as to where the deepest water in the river would be found. On several occasions one or the other would have to turn back and follow the one who happened to find the best water. Witness states there were also times when they both got stuck at once at different points along the river. He states that in the reach from Sandy Springs to Tulsa, about six or seven miles, they had to cross the river in a zigzag fashion about ten or twelve times in attempting to follow the deepest water, and that on the trip from Cleveland to Tulsa they had to jump out and pull the boat off sand bars quite often. Witness states that he has made an examination for determining the duration and time of occurrence of high stages

of the river. This he has done by taking the official publications of the Weather Bureau as to gauge readings at Tulsa and at Webbers Falls and has platted therefrom what he terms a "Hydrograph." The hydrograph from Tulsa covering the years from 1905 to 1915, inclusive, witness produces (Exhibit 68). This hydrograph is a graphical [representations] of the table gauge readings. The height of the irregular line shows the number of feet of the gauge, according to the scale as it is placed on the left hand side of the drawing for each year. The lines running up and down represent a period of one day each.

Cross-Examination

By Mr. Ledbetter:

Replying to the question as to what the map is based on, witness states that it is really a graphical representation of the published records of the Weather Bureau, and by this he means the height of the gauge or the height of the river read each day. These records, witness states, he obtained from the certified copy in the Weather Bureau. These Weather Bureau gauge readings are published by authority of the United States Government at Tulsa and sent by one of their officers to the Weather Bureau at Washington where the official record is kept. In explaining what a hydrograph is, witness states that, for instance, on the first of January, 1905, it reads two feet. He will make a little dot of that gauge reading which would mean the height of the river on that gauge at that point but not any particular depth of the river. The gauge refers to seal level so that by calculation it can be determined how high the river is above sea level; for each day these little points are platted and a curve is drawn through them and the irregularity of that curve shows the rise and fall in the river and the duration—floods whenever they occur.

Redirect Examination

By Mr. Kearful:

Witness states that the hydrograph does not show the channel depth. Its purpose is to show graphically the stage of the river at that particular point from day to day so that you can see at a glance the rises and falls in the river without being able to determine the channel depths although it indicates a certain amount of water on that particular gauge. At this point Exhibit 68 was offered in evidence by the Government. Witness states that he has made an investigation of the Webbers Falls gauge records from 1904 to 1911 inclusive as kept at Webbers Falls. This he made in order to plat the

hydrograph. This hydrograph, witness states, is a graphical representation of the gauge readings at Webbers Falls from the year 1904 to August, 1911, inclusive, and represents the actual condition as to the extent of the overflow and the limits which that overflow reached, or the flood. It does not indicate the actual channel depth in the river but it does indicate the duration and time of arrival of high water. At this point the Government offered in evidence Exhibit No. 69. Wit-

555 ness states that the Arkansas river in its natural condition above the Grand river without the aid of artificial improvement has no navigable capacity for the reason that it does not offer a channel for trade and traffic in the customary modes of trade and traffic on water.

Cross-Examination

By Mr. Ledbetter:

Referring to movable dams, witness states that he means a dam that you can let down and put up again within certain limits. It is the frame on top of the concrete foundation that [permis] of that structure. Replying to the question as to whether or not during the ordinary high water there is not sufficient quantity of water in the river to sustain ordinary navigation, witness states that there is never water within very short limits, the reason being that the floods do not stay up long enough. As a rule the floods last a week or ten days and you cannot go any where. Witness states that by referring to the hydrograph made by him you can see at a glance how long the river stays up and how many days you can go somewhere and get back. Witness states that his opinion that the Arkansas river above the Grand is not a navigable stream is based on the present condition of the river. He further states that even though there were no other means of transportation in the country it would be absolutely impossible to canalize the river by means of movable dams so as to make it useful for the transportation of freight at any time. Witness states that by this he refers to ordinary traffic; of course you can take skiffs over the river at any time. Witness states that he does not believe naptha launches could be taken over the river if it were canalized. He bases this statement on the fact that at quite a moderate stage the river does not have anything more than twelve inches of water in it and you cannot take anything over that. A naptha launch, he states, will draw more than twelve inches as a rule, always. He states that a flat bottom boat carrying a couple of tons would be all that could be gotten through the channels as he found them last

month when there was ten or fifteen times as much
 556 water as the low water flow. He states that he went
 over the river during the past month for the purpose
 of examining the conditions as he found them in order to
 testify in this case, and that he was accompanied by Mr. Kear-
 ful. Witness again states that no amount of money or skill
 could be employed to canalize the river anywhere above the
 Grand so as to make navigation.

Recross Examination

By Mr. Freeling:

Witness states that he cannot agree with the report of the
 Secretary [or] War to Congress, dated December 6, 1909,
 in which it is stated that if the river from Fort Smith to
 Tulsa is to be improved it should be by a system of locks
 and dams estimated to cost ten million forty-four thousand
 dollars.

Redirect Examination

By Mr. Kearful:

Witness states that he was only acquainted by reputation
 with Captain H. S. Taber, who was in charge of the Little
 Rock office, and that Captain Taber's reputation was not good
 as an engineer. (This last statement of witness was ob-
 jected to as an impeachment of the witness, and sustained by
 the Court.) Witness states that he been a member for
 sixteen years of the American Society of Civil Engineers and
 that a great many engineers of the Army Corps are also
 members.

Cross-Examination

By Mr. Ledbetter:

Witness states that the qualifications necessary for member-
 ship to the Society for Civil Engineers are that you must
 have had ten years experience, five of which in responsible
 charge of work before you could become a full member, and
 that a graduation from an engineering school reduces that re-
 quirement by two years, and before becoming a full member
 the applicant must be thirty-one years of age. Witness states
 that he [go] in on his experience and that he is a graduate
 of Leigh High University of South Bethlehem, Pennsylvania
 —according to his idea one of the best engineering schools
 in the country.

557 Copies of the Government's Exhibits 68 and 69, to-wit,
 —the Tulsa hydrograph and the Webber's Falls hydro-

graph, are attached at the end of this statement of facts and are incorporated in and form part of the same.

Exhibit 70 of the Government, introduced during the testimony of the following witness, Joseph Evins, being the annual report of operations of the U. S. Snag Boat Wichita for the fiscal year ending June 30, 1882, made by said Joseph Evins to Captain Thomas H. Handbury, Corps of Engineers, U. S. A., Little Rock, Arkansas, omitting address and signature, reads:

(Plaintiff's Exhibit 70.)

558 I have the honor to submit the following report of operations for improving the Arkansas River from Fort Smith Arks. to Wichita Kansas, during the fiscal year ending June 30th, 1882.

Under your orders of the 24th day of September 1881, I took charge of the new light Snag Boat "Wichita" and proceeded up the river on September 28th, 1881 intending to go as far as Arkansas City, Kans. removing such obstructions as were in our way. There is a highway bridge at Arkansas City and several between there and Wichita that will have to be removed or draws put in before boats can pass. We arrived at Fort Gibson on 10th day of October, 1881, on about 6 feet water in the channel; found nothing to obstruct our way on that stage of water. By lowering the chimneys the boat passed under the M. K. & T. R. R. bridge with about 5 feet to spare. Above the mouth of Verdigris we found the river channel very crooked and reefy sand very coarse and constantly drifting. We frequently struck the sand bars, boat drawing 15 inches, when there was an average depth of 5 feet in the river. We arrived at Mouth of Snake Creek on the 18th day of October, 1881, found less than 1 foot water, lay by 4 days, chopped wood. The river rose about 2 feet and we moved up about 50 miles farther, about 8 miles above the Cimarron. At this point we found less than 1 foot of water. We lay here 17 days then on another rise we succeeded in reaching the Pawnee Agency landing about 75 miles below Arkansas City on the 21st day of November, 1881, here we remained until 28th day of February 1882 not having sufficient water at anytime to move either up or down a distance of one mile. From the R. R. bridge near Fort Gibson I found the river obstructed by a great many small islands and tow heads. The bed of the river in great many places is from $\frac{1}{2}$ to 3.4 miles wide and about the same depth of water

in the different channels between the islands towheads and bars. The character of the sand here is coarse and seeks its level almost like water. On days near mouth of

559 Cimarron. Arrived at Fort Gibson on the 9th day of May 1882 having been on the trip 7 months and 12 days. We came out from the Cimarron without any trouble on 3 feet rise, distance about 130 miles, time only 3 days. During our stay above Fort Gibson there was 4 months of the time that we did not have rain fall to the amount of $1\frac{1}{2}$ inches yet there was sufficient water if it could have been confined in a narrow channel say 200 to 300 feet, to afford a channel depth of $2\frac{1}{2}$ to 3 feet. Very few boulders in the river. Found rock bottom at several points but generally smooth and more water than on the bars. The country above Fort Gibson bordering on the river is mostly prairie with timber skirting the shores. Rocky stone, brush and timber of the best quality to construct improvements on the river. Between Fort Gibson and Fort Smith the river is equal if not the best part of the Arkansas. With some improvements say few dykes, removing snags and some rock it can be navigated the year round by light steamers. The entire country through which we passed as yet is undeveloped but the land for agricultural purposes from Kansas to Arkansas bordering on the Arkansas river is equal if not the best body of land in the West. If navigation was opened by river through to Kansas, the commerce by river would simply be immense with heavy increase annually as the country is settled through the Indian Territory. The natural market for the productions of Kansas and the Indian Territory is south by the way of the Mississippi River. Kansas is suffering greatly for want of cheap transportation by which she can be supplied with fuel, coal and lumber, all of which could be sent from the state of Arks. at less than one half of what Kansas now pays while the cotton country south could give Kansas a market for her immense amount of surplus of corn, wheat, pork and beef. From my observations during the low water of last fall and winter I do not think there is a doubt but what a good channel depth of at least 3 feet can [ve] made to Arkansas City, Kansas, and there is is no country that needs it worse than Kansas and the Indian country. I found the Indians especially the wild tribes, Osages, Pawnees, Ottoes, Ponkas, and Kaws very friendly and delighted with the prospect of opening navigation through their country. (A Line of steamers running through their country would have more influence in civilizing them and building up the country

560 than all the Agencies yet established.) Not being able

on account of the lateness of the season and low water to get through to Arkansas City there was very little accomplished. We removed a few snags and drift piles, out what leaning timber we found in the way. On our arrival at Fort Smith on May 10th, 1882 we shipped a working crew (having on board only sufficient number to watch and guard the boat through the winter) and commenced active operations between Fort Smith and Fort Gibson. The river since that time has been high, covering nearly all the obstructions. When the water declines will be able to accomplish good results in removing snags on this portion of the river. I omitted to state when speaking of the upper portion of the river above Fort Gibson that there was very few snags and but few leaning trees in the way of boats. The trouble being too much river bed for the volume of water. To make a channel it must be narrowed and confined. From the best information I can obtain there will be an increase in the shipment of cotton, wheat, corn, hay, hides, beef cattle and hogs of 100 per cent over last year. The number of bales cotton sent out by river last year was about 1500. The same territory will ship about 3000 bales this season. The exports of other articles will increase in about the same proportion. The steamer Fort Smith has been making weekly trips between Fort Smith and Fort Gibson for over a year. Boats of 500 tons burden could navigate this portion of the river usually 9 months in the year with safety.

Work done during the year:

No. Snags pulled	72
No. Drift Piles removed.....	3
No. Trees cut	89
No. Trees deadened	6288
No. Feet brush dyke constructed.....	24000
No. Cords wood chopped by crew.....	140
No. Miles run	1580

561 JOSEPH EVINS, Dardanelle, Arkansas, testified as a witness on behalf of the Government, on direct examination, by Mr. Kearful, as follows:

Witness states that he is in his 82d year and that his occupation has been mostly boating and steamboating. In 1852 he was an officer, as clerk of the boat on the Cumberland river, and over half of the time since he has been engaged in and interested in boating. Witness states that he came to the Arkansas in July, 1890, and brought his own boat when he

came down. He states that he merchandised on the Arkansas river for about six years—forty years ago, and when he first came to the Arkansas there was a larger class of boats [then] they have had since, mostly cotton boats and some pretty heavy draft. A number of these boats would carry two thousand to five thousand bales of cotton. After the railroads were built the size of the boats were reduced. As the character of the river changed, the boats were built lighter. All these boats were flat bottom boats, especially the later ones which were designed for shallow water. Witness states that he built the Government snag boat called the "Wichita" at Little Rock. This boat he states was intended to be as light a boat as possible, and much lighter than any other snag boats with which he was familiar. For a few months, witness states, he operated the "Wichita". In 1881, witness states, he started from Little Rock up the river to the mouth of the Grand. They arrived without any difficulties. From the mouth of the Grand they attempted to go on up. After leaving the Grand they got up to the bridge all right, passing under the bridge. The first day out they struck eighteen inches of water. Witness states that the bed of the river above the Grand was wider. On this trip, he states, they went up as far as Pawnee agency and the trip was made under the direction of Captain Thomas H. Handbury, Corps of United States Engineers, Little Rock, to whom he made weekly reports.

Witness states that in his report of October 15, when
562 just below Fort Gibson, he stated that the further up he moved the more difficulties they encountered and that there were places in the river bed nearly a mile wide out in small channels leaving little else but bars scattered over the river and that was the general condition in which he found the river at that time. He also states that he recalls writing from the United States snag boat Wichita Creek Nation. "Since writing you from Fort Gibson we have made slow progress. The river has continued to fall until there is very little left. He worked six hours yesterday poling up on ten inches of water and then had to pole back into deep water, it being dangerous to have the boat aground over night for fear of change in the channel." Witness states that the only way he could get up the river was to take advantage of a rise in the river. Referring to the statement in his log book of sparring over sand-bars, witness states that that means he used the spars, one on each side, to raise the boat up; set them at an angle and spar—what they will stand—probably raised three or four inches and get the boat ahead a little at a time. By this method a boat can be sparrd over prob-

ably [sin] inches less water than she is drawing, if you have got proper rigging and tackle to do it with. The boat will jump a little at a time. These spars, witness states, are made of wood of different lengths. On his boat the spars were thirty feet long and with double and triple blocks and a steam capstan you can raise anything, but it is a very slow process, and witness states had to be used frequently. If he wanted the boat to go straight ahead he set the spars straight with the boat, if he wanted to go to the star board he set one to the larboard side and shoved her over. At this point witness illustrated the method of procedure. When it was not necessary to raise the boat up they did not use the spars at all but ran a straight line ahead of the boat and used the steam capstan and by putting a heavy strain on it would jerk the boat up and it would jump ahead. The line which they used was fastened to some permanent object. Witness states that he was obliged to remain at the Pawnee agency something less than four months because the water got down so low he could not get up nor down. He states that his boat was in a pool of water between two rock bars. He states that the place where the boat was, was better than any other place on the river for the reason that it was rock bottom and not sand and they probably got all the water there was in the river. He states that when the river rose a little he started down and on this trip they had a great deal of difficulty on account of low water, as shown by the log. This trip, witness states, as he recollects, took him from February until May and the whole expedition consumed seven months and twelve days. Witness states on this trip the only improvement that he attempted was to pull two snags and probably remove one rock in the channel he was going through; most of the time he was trying to get the boat up the river. The water in the river at the time, witness states, was equal to, if not better than at, the average season, there being very little ice in the river where he was. Witness states that he has boated on the river up to three years ago and he operated between the mouth of the river and Fort Gibson but he has never since attempted to go above Fort Gibson or above the mouth of Grand river on the Arkansas. The reason he has not attempted to do so was because he did not think it was feasible. He states that he has no personal knowledge of any one conducting any business on the river above the mouth of the Grand by boats, the mouth of the Grand or up the Grand a couple of miles to Fort Gibson being as far up as any one would go. Witness states that the Grand river is [as] a clear

a mountain stream entirely different from the Arkansas and does not run out as rapidly. In low water, witness states that he could safely say the Grand furnishes four times as much water as the Arkansas, the bed and banks being narrower. The bed of the Grand, witness states, is gravel and not much sand. He states that the Verdigris enters the Arkansas

about a mile above the Grand and is more like the Ark-
 564 kansas river and as far as water is concerned was never regarded as amounting to anything. Witness states that during his acquaintance with the Arkansas river, dating back to 1860, he has noticed a very great change in the river. In the early days the river was much narrower than it is today. There are twenty places twice as wide as it was and the river will average a third in width over what it was in 1860. In the early days there was hardly ever less than three feet of water through to Forts Smith and Gibson, and for several months in the year every year. Now below the mouth of the Grand they frequently do not have over fourteen inches of water in the summer. Witness states that the river has gradually got to the condition in which it is in at the present time and that it is getting worst all the time by caving of the banks and the erosion of the banks and widening of the river bed. He states that frequently he has run a steamboat up the river drawing all the water there was at the time. If there was two and one-half feet he would be drawing two and one-half feet, and he would run up and touch bottom—or it might be he would only find two feet, in which case he would go to work and run the boat up and work the same out. One time he struck a place where he was only drawing about four or five inches more water than there was. A three foot rise came on the [next] morning when he raised steam to go out and found that he did not have the same water he did the night before but across the river a quarter of a mile or so there was hardly any difference in the depth of the water, for between a half and three-quarters of a mile. The reason for that was because of the flowing sand; the sand-bars came right down and spread out and the water spread out on it filling up the channel, the water having spread out so much it did not go in any special channel. In that case he turned the stearn of the boat up so that in four or five hours he worked a channel through which he could go into. Witness states that the character of the

565 Arkansas river is very peculiar. Witness states that during the time that he has known the river, since 1860, it has not been practical to operate any boats above the mouth of the Grand and the boats that have been in use are the kind that are customarily used for trade and traffic on shallow

water. He further states that it is not practicable for boats in the ordinary course of trade and traffic to conduct this sparring, and hauling operations, which he spoke of as being necessary to get over the sand-bars. Witness states that while the snag boat that he built was rigged completely with rigging and blocks he never went with her above the mouth of the Grand river after the one trip, he did, however, operate the boat for a short time from Fort Smith to Fort Gibson. Witness states that regarding the practicability of narrowing the channel of the river in order to make it better for navigation, that he is not an engineer though he put in the second revetment that was put in in the United States, Eads having put in the [first] at the south pass of the Mississippi river. In this connection, witness states that he did work at Fort Smith under the direction of Major Suter of the United States Engineers at Saint Louis. He states that he was a contractor for several years and furnished material to the Missouri River Commission.

Cross-Examination

By Mr. Freeling:

Witness states that back in 1860 there were a great many boats on the Arkansas river through Arkansas and at the time there were only a few miles of railroad in the State, nearly all of the transportation being by water and wagons. He states that while they had to wait for a rise in the river, most of the cotton was hauled out on boats, three or four thousand bales being a common cargo. The name of the boat that hauled the largest number of bales was the "Exporter." This boat, witness states, ran from New Orleans to Fort Gibson. Witness states that he shipped cotton on this boat himself and that in those days there were a number of boats running on the Arkansas, among them the "Fanny Scott",
 566 "Judge Fletcher," "Pine Bluff," "Fort Smith," "Judge Wheeler," "Van Buren," "City of Little Rock," "Florence Myer," "Rose Douglas," "Clarksville," "John Howard," "Tahlequah," "J. B. Hall," "Edenburg," "Alamo," "Gov. Garland," "Mary Boyd," "Skylark," "Drugh," "Border City," "The S. S. Brown," and a number of others. The "S. S. Brown", witness states, was about an eighteen hundred ton boat and only made one trip up the Arkansas river as far as Little Rock. The "Border City" and the "Drugh," were local boats from Fort Smith to Gibson and the mouth of Grand river. Besides these two last named boats, witness states that a good many of the other boats named by him made trips into Oklahoma up to Fort Gibson or Webbers Falls. Some of the boats that came out of Arkansas into Ok-

lahoma on the Arkansas river, about Fort Smith, witness states, from memory were the "Arkansas", "Leon," "Lady Walton," "Mary C. Lucas," and "Tahlequah." Witness states the "Cleveland" was another boat on the Arkansas river which he understood made a trip in Oklahoma above the Grand river. He states that the Cleveland got through this trip in some way but he does not know how, and was sold to the Government, who condemned her, after which he bought her and used her as a . . . boat. "The Mary D" was another boat that ran into Oklahoma from Fort Smith up, as he understood, to the mouth of the Grand—Fort Gibson. Witness states that he has heard of the "Carrie Clyde", the boat that sunk on a sand-bar, also "The City of Muskogee" as a boat making a trip from Fort Smith into Oklahoma. He states that the Arkansas river in Arkansas is very uncertain as to navigability, that there is about the same normal flow as there was in 1860, also the same rain fall every year but there is more bed for it and less navigable water. So far as the water is concerned, witness states that he thinks it is about the same [valume]. Witness states that he does not know of any boats navigating the river above the Grand. In coming over from Arkansas with the snag boat "Wichita" to the mouth of the

Grand, he states he experienced the usual trouble in the
 567 Arkansas, it being a very difficult and dangerous river to travel at any time on account of the snags, etc., but there was plenty of water. North of the mouth of the Grand is where the main trouble set in. Witness states that the Pawnee agency at the time was the old Coffeerville Road landing and was the point where they laid up—about seventy-five miles from Arkansas City, Kansas. He again states that they remained at this point until after the water rose in the river when they started on the return trip. Witness states that he thinks he was about twenty-one months working for the Government on the river and that during that time Captain Handbury was in charge of the work and always had money to pay his bills. Witness states that when he made this trip he intended to go as far as Arkansas City and back.

Redirect Examination

By Mr. Kearful:

At this point, in connection with the weekly reports and the log book, the Government offered in evidence a certified copy of the annual report for the year ending June 30, 1882,—the portion signed by Captain Evins, marked "Exhibit No. 70". Witness states that he was enthusiastic in his letters and communications to Captain Handbury about improving the river up to Arkansas City in the beginning because it was

an enterprise they all looked forward to with a great deal of interest; at the time they thought they would be able to make the trip and improve the river. Referring to his letter of October 9, 1881, when he was twenty miles below Fort Gibson in which he states that it was his intention to rush through Arkansas City on the present water, the prospects being that he would reach that point about the 17th, he based this assumption that he would reach Arkansas City in eight days from the mouth of the Grand upon the slow rise in the river, and they had had no trouble for about twenty miles up the river, and if they had continued to have no trouble they would have gotten there easily. That is, if they had water enough.

568 Witness states that he did not know what kind of river it was until after he started to investigate, never having been on it with a boat. In his letter of December 4, 1881, to Captain Handbury, he states, that "Gov. St. John of Kansas with a party of friends will be here tomorrow to see the boat." The party came down with the exception of the Governor who sent an excuse. They all stated that they hadn't seen the river so low for a long time and hoped that there would soon be water enough to enable them to get up to the city. Witness states that according to his subsequent experience at the time the party visited him the condition of the water, as compared with other times that he spent over the river since, was about the same.

Q. Now, with reference to a statement in your annual report which has just been read, you stated 'I do not think there is a doubt but that a good channel depth of at least three feet can be made to Arkansas City, Kansas, and there is no country that needs it worse than Kansas and the Indian country.' That statement would not appear to be entirely in harmony with your letters and entries in your log book. Have you any explanation to make in regard to that statement?

A. Why, I am very much surprised at it. When I learned of it the other day, the first I had ever heard of it, I am satisfied I never saw that. I would like to make a statement concerning that matter.

Q. Very well. A. Do I have permission?

By the Court: Proceed.

A. There's two ways that that could have gotten in there without my knowing anything about it. When we first went up there, in fact until we got there and stayed there some time, we were enthusiastic about getting up and doing something with that project. Some memorandum might have been

made at that time that would have induced my clerk, who I find out from the handwriting made that report—I never wrote that report—I never read that report after I signed it, and I am satisfied I signed it without ever reading it

569 at all—that he might have put that report—might have made that report up from that data. Now, the surroundings—the experience of that trip and the surroundings is altogether contrary to that statement and it couldn't have been made as a fact because I knew—that occurred in June after I returned—after all my trouble there and my log is absolutely correct—I have read that over; I will verify all of that, but this other is not; that is wholly unjustifiable—that report. It is true that was guess work, but I couldn't make that kind of a guess. I was situated there in between two rock shoals in a pool of water. There was a rock above me and rock below me, and I have been on the river all my life—I never lived off the river a year—off a navigable river a year in my life and I think I know something about water. We walked across on top of those rocks across the river there; there was a little water trickling through them, I don't know how much, but there couldn't have been but a little but as to being enough to confine it to two or three hundred feet to be two or three feet, why that's ridiculous. There wasn't enough water to have made a foot a hundred feet wide. I doubt very much whether it would have made six inches a hundred feet wide. So this should be eliminated from that report. It is certainly incorrect.

Q. The weekly letters that you wrote to Captain Handbury, did you write those yourself during that trip?

A. I kept that log myself and I expect I wrote those letters. I am not sure about that. I could tell from the handwriting, but if I had of known—there's not been a time in the—now it has been thirty four years and if I had know that report to have been in existence—this suit would have had nothing to have done with it—I should have had that report corrected because I believe it misled Captain Handbury in making his report to the general office. That made the matter rather serious. I regret that more than anything else. Captain Handbury is dead now; if he wasn't I would write him in regard to that matter; him and I were almost like brothers.

570 That report in there is wholly unjustifiable from the facts in the case. The log is correct; that is entered every day. That is entered after the thing is passed over and we have seen what it was; but that other is not correct; is not justifiable at all in that report.

Q. That's all.

Recross Examination

By Mr. Ledbetter:

Witness states that he never saw the original report that was filed until he saw it "here in this house." (At this point counsel for the Government produced for the examination of the defense the original report referred to.)

Witness states that he was hopeful that the copy was not correct but he found it was correct and in the hand-writing of his clerk though signed by him. He states that he signed the report under a misapprehension as he could not have read it. He states that the statement referred to is not at all justifiable, that the second clause in the report regarding the annual shipment of freight applies below the mouth of Grand River. Up to the time that he came out, witness states he never saw or head of a bale of cotton coming out by water from the upper Arkansas. Witness states that after he returned from the trip up the Arkansas he resigned and went to the Mississippi river. He does not recall how long after he returned from this trip he remained in the service, or whether his report was made before or after he resigned. Witness states that his clerk did not accompany him on the trip to the Pawnee Agency but got on the boat after he came out. Witness states that the information in the report might have been gotten from him or from the log by the clerk and that he does not remember going over the log with the clerk before the report was written and signed by him. Witness states that before his attention was called to his annual report on the operations of the snag boat "Wichita", he did not have in mind having made this report as it was this custom to make reports.

571 The intention of the report, witness states, was to give a resume of the operations of the boat during the year. Referring to the statement in the report. "From my observation during the low water of last fall and winter, I do not thing there is a doubt but what a good channel depth of at least three feet can be made to Arkansas City, and there is no country that needs it worse than Kansas, and the Indian territory," witness again states that that was an error and is not correct, and this would have been his belief had he known it to be in the report at the time he signed it. Witness states that the report that he signed was to become a permanent record of the Government relating to the navigation of the Arkansas river; he also states that it was intended to be correct but that is not correct. Witness states that he could not have made the statement in his report because there couldn't have been twelve inches of water two hundred feet

wide where it come over the rock and where you are apt to get all the water. He states that he found more water on rock shoals as he went up than he did on sand, and that in moving the rocks you would not get as much water on account of the seepage in sand. Witness states that if moveable dams were put in the river and the water confined within a channel of two hundred feet, he does not think they could get more than a foot of water. He states that when he got to Pawnee landing there was more than a foot of water but after he arrived there they kept no log as the river began falling until it went almost dry so that they were able to walk across on the rocks without wetting their feet. Witness states these conditions continued for four months and was at ordinarily low water season. Witness recalls that at Snake Creek near Tulsa his log showed eighteen inches of water. In his annual report, witness states, referring to the portion of the river above Fort Gibson that there are very few snags and but few leaning trees, all the trouble being too much river bed for the volume of water. Witness further states

572 that in some places the water spread out for four thousand feet. If in a case where the water ran down the bed of the river and spread out over the channel for a thousand feet and that volume of water was confined to a channel of two hundred feet, witness states it would produce a depth of water five times as much as was mentioned in the annual report. In places where the water spread out over the channel five hundred feet wide there would still be more water than the depth mentioned in the annual report. He states that his work for the Government was simply removing obstructions from the river and so far as he knows had nothing to do with reference to conalizing the river in pursuance of any general policy of the Government to make the Arkansas river navigable; while he had heard that the question of making a canal in the river was under discussion, he was never consulted at all about it, nor did he ever discuss it with the engineers. Witness states that when he referred to the fact that a channel two or three hundred feet wide would maintain water three or four feet deep he did not mean that to apply up to Arkansas City, but below the Grand. If it appears so in his report, witness states that it should not be there in that way because every one who knows anything about the Arkansas river for the last thirty years knows there was no cotton at that time brought out of upper Oklahoma by river. He states that his reference to the transportation of cotton relates to cotton produced entirely below the mouth of the Grand river, or in that vicinity. He further

states that his reference that there would be an increase in the shipment of cotton, wheat, corn, hay, hides, etc., of one hundred per cent over last year evidently referred to below the mouth of Grand river, the land at Muskogee being near the mouth of the Grand river, and those products were produced between Grand river and Fort Smith. Witness states that he has never heard of anything being shipped out by river up there" previous to his trip.

Re-Cross Examination

By Mr. Freeling:

Witness states that he was employed by the Little Rock office and drew requisitions upon the appropriation
573 for improving the Arkansas river, Arkansas, and Kansas. Blanks were furnished to him for this purpose upon which he wrote, "Improving Arkansas river, Arkansas and Kansas." Witness again states that while the report is not in his own handwriting, he signed it.

Re-Direct Examination

By Mr. Kearful:

Witness states that his opinion is that the upper river is the same now as it was after he returned from his trip—if anything, the entire river is getting a little worse all the time. Nor is his opinion any different with reference to the practicability of narrowing the channel at the point where he was stranded so long so as to produce a three foot channel.

At this point the Government rested its case in chief.

EDWARD O. TILBURN, Tulsa, Oklahoma, testified as a witness on behalf of the defense, on direct examination by Mr. Reeling, as follows:

Witness states that he is secretary of the chamber of Commerce of Tulsa, which position he has occupied for six months, prior to that time he was assistant secretary of the Chamber of Commerce in Los Angeles, and occupied the same position with the Chamber of Commerce, at San Diego, California. As Secretary of the Chamber of Commerce, witness states that he interested himself in the improvement of the Arkansas river, also in the building of bridges over that stream. He states that these matters came up in the regular routine of work when he took his position of Tulsa. Witness explains that Exhibit "A" is a letter written under instructions of the Board of Directors of the Chamber of Com-

merce of Tulsa, addressed him, instructing him to write to Hon. Lindlay M. Garrison, Secretary of War, Washington, D. C., and is a copy of the letter he addressed and mailed to Secretary Garrison. At this point defendants offered in evidence Exhibit "A" which reads:

574

"October 25, 1915.

Honorable Lindley M. Garrison,
Secretary of War,
Washington, D. C.

Honored Sir:

As you are doubtless aware the County of Tulsa is all prepared to build a new concrete bridge across the Arkansas river at this point. We are informed that there is a difference of opinion in the minds of several Departments of the Government as to whether the Arkansas River is navigable or not. If navigable in the construction of this bridge provisions would have to be made for a draw bridge through which vessels might pass. Owing to the fact that there are numerous bridges spanning the river both below and above the proposed new bridge it would seem to us that such a provision might be unnecessary, but in order that this matter may be fully determined a motion was made at the last meeting of our Board of Directors of the Chamber of Commerce and Federation of Allied Interests of Tulsa that an invitation be extended to yourself, as your representatives, to visit Tulsa and investigate this matter in order that this work might progress without further hindrance.

Trusting that you will give this your consideration, we are,

Very respectfully yours,

CHAMBER OF COMMERCE

T-M

..... Secretary."

This letter witness states was signed by him for the Chamber of Commerce. Referring to Exhibit "AI" witness states that that is a reply to the letters that were sent to the Secretary of War and Secretary of the Navy, respectively, or the Major of the Corps of Engineers of the War Department. These letters, he states, were received in the course of mail in answer to the letters he had addressed.

At this point, the defendants offered in evidence Exhibit "A1" which reads:

"War Department.

98413-20 Office of the Chief of Engineers.

Washington.

STH/clb

November 6, 1915.

Mr. E. O. Tilburne,
Secretary, Chamber of Commerce,
Tulsa, Oklahoma,

Dear Sir:

1. Referring to your letters of the 25th, ultimo to the Secretary of War and the Secretary of the Navy, respectively, in regard to a bridge proposed to be constructed across the Arkansas River at Tulsa, Okla., I beg to inform you that the Arkansas River is a navigable waterway of the United States and is what is termed an interstate stream being navigable in more than one State. In view of this fact the first requisite necessary to the erection of a bridge thereover is an Act of Congress authorizing its construction, in conformity with the provisions of section 9 of the river and harbor
575 Act of March 3, 1899.

2. Application was recently made by the County Commissioners of Tulsa County, Okla., for approval of plans of a bridge proposed to be built across the Arkansas river at Tulsa, Okla., but in the absence of the Congressional authority for its construction of the Department declined to take action on the plans, and the County authorities have been so advised.

By direction of the Chief of Engineers,

Very respectfully,

W. KELLY.

Major, Corps of Engineers."

Witness states that he addressed the same letter to the Secretary of the Navy that he addressed to the Secretary of War, and he received a reply from Mr. Daniels stating that the matter had been referred to the Secretary of War. Referring to what had been done in Congress recently concerning the building of a bridge over the Arkansas river at Tulsa, witness states that he understands an appropriation has been made but he does not know the amount or the details.

IRVING PERRINE, Oklahoma City, Oklahoma, testified as a witness on behalf of the defendants, the City of Oklahoma and its lessees, on direct examination by Mr. Freeling, as follows:

Witness states that he is thirty-one years of age, and that he is Chief Geologist of the Pierce Oil Corporation, and the Pierce Fordyce Oil Association of Texas. He states that he has been connected with these companies since June 8, 1915. Prior to his association with these companies, witness states that he was located at Norman, Oklahoma, as professor of stratigraphic geology and paleontology, University of Oklahoma; he states that he is a graduate of Cornell, with a degree of A. B., A. M. and Ph. D. He states that he took a doctor's degree in geology in June, 1912. After receiving his degrees, witness states that he was assistant in geology for the year 1907-08; instructor in geology 1908 to 1911, and professor in the summer sessions from that time until he was employed by the Pierce people. In February, 1912, he entered the employment of the University of Oklahoma as professor of geology. Witness states that he believes he is thoroughly qualified to investigate currents of streams, erosion of banks
 576 and channels of rivers. In this connection, he states that he has made an investigation recently of the condition of the Arkansas river at the point where Turkey Island is located in the river. Witness states that he went over the island referred to in plaintiff's Exhibit 10, being a map of Turkey Island, in the Arkansas river, in Sec. 25 & 30, T. 21 N., R. 8 & 8. E. Ind. Mer. showing two channels or two places where the river flows, one on the north side and one on the south side of the island. Witness states that prior to his field investigation he took a United States geological survey map of that area and made a study of the river up stream from the particular point—Turkey Island—noting from that map the condition of the banks, the direction to which the channel would naturally flow, the current, to one side and the other, and got some kind of an idea as to whether the channel should be on the north side or the south side; whether it should be a single or a double channel, before he went into the field. The topographical map shows clearly just what the Mississippi river shows, or any other river which is meandering; that is, swinging back and forth from one back to the other, that the channel and the current itself will be diverted first from one bank to another, and as the river swings from one bank to the other, it cuts on one back and deposits material on the other. Just above Turkey Island, witness states, the river is swinging down, flowing in a southwestern direction, and cuts a bluff up stream from Turkey Island. Then the channel is diverted

directly across to the opposite side so that now the main channel in this particular region is the so-called "north channel." Witness further states that the south channel is not at the present time with water; and that you can walk across to Turkey Island without getting your feet wet, by going rapidly over the quick-sand. Witness states that all the evidence tends to show that the north channel is the major channel at all times of the year now, but during high water the water goes

across the south channel probably at an even faster
577 rate than it does across the north channel. You can see where the river has simply swept the whole of the south channel clear of sediment and debris of all sorts during high water stages. Witness states the tendency of water that is meandering when it strikes an object on one bank, is to be thrown to the opposite bank, and this he found to be the condition existing in the Arkansas river. On the north side of the island itself the banks are very steep, indicating that the current now is running a little more to that side than it is to the mainland on the north side—Osage side of the river. On the south side of the island the channel, as stated, is only a water channel in high water; there are places where the banks are steep, and other places where you would not know whether you were on the channel or on the island. Witness states that the south channel is simply a short cut in times of high water and is more of an overflow channel. He further states that it is the tendency of all meandering streams that form a large bend, and the bend gets larger and larger until finally the curving neck cuts away and makes what is called an "ox-bow cut off in these streams. From his investigation, witness states that neither the north or south channel is the original channel. The original channel was a stream which flowed from the north bank through to the south bank, there being no island at all originally. His reasons for this statement are based on the fact that the island shows at every point of observation which was made around it that it is simply an island deposited in the channel. It was started probably like all other islands in that region, by obstructions in the stream during periods of low or normal stages of the river, and this island has rapidly grown to its present dimensions so that you cannot say that either channel was the main channel, from the old channel was one extending from the north bank to the south bank of the river proper with
578 probably no island there at all. Witness states it is hardly possible for him to give the age of the island for the reason that it may have grown rapidly and cut away, and grown again, and so on. Witness states that he

found large trees growing on the island which would indicate that it was at least five hundred years old. Other evidences for estimating the age of the island are the [siz] of the island for one thing; the fact that vegetation has grown entirely over the island, indicating that large trees have formed, died, and their trunks lay there in a decayed state. The fact that young trees are growing over the island in great profusion indicate that vegetation has taken form over the island and that it does not take place in a few years. The soil of the island itself, witness states, is practically, entirely, composed of river sands, muds, clay, and sediment, there being no rocks of any kind on the island. He states that he does not think any of it is subject to cultivation. The bank of the island at the south of the north channel witness found to be almost vertical in places. At that point he took a boat and went over from the island to the mainland. It is almost straight up and down to get in a boat, and the water is flowing close to the bank. On the north shore line of the south channel the banks are steep in places, but in other places it could not be told from the river channel itself; it all seems one pieve of ground at places; in other places you have a well defined channel. Witness states that he found the south channel dry except the lower portion where the water is backed up from the south extension. Witness states that as far as he could see the island overflows almost entirely. On the derrick standing on the north shore of the island, the floor of which is two or three feet above the ground level, there is mud a foot and a half, and all over the island are places where mud, roots, grasses and so on, have been caught in trees in places as high as the level of his eye above the ground level of the island. He states, however, that there are small areas where it has not overflowed recently. Witness states that there is a small log [cabin] on the west side and a small hut on the east side of the island. He did not go into the log cabin but in 579 the small house to the east there was mud on the floor which had probably not been scraped off by the present owner since the last high water, indicating that the water had stood above the floor level in that hut. Witness states that there are suspicions of mud everywhere on the floor of the derrick, and high water mark can be traced all along on the boards of the derrick proper, at least four feet in places above the ground. Witness states that this derrick is located on the map by the mark "oil well". He states that at the time he made the trip to the island he took a small map with him and a small copy of the Hominy Quadrangle of that particular section. This quadrangle witness states is one of the United States

geological survey maps of Oklahoma and the region centering around Osage, Cleveland, Hominy, and the Arkansas river. Witness states that he did not take any compass with him to verify the direction of the channel, or anything of that sort but so far as he could tell the map which he had with him correctly pictured the tendency and direction of the stream. He states that about a mile above Turkey island he located the bluff which is shown clearly on the map on the south side of the river. This bluff, witness states, would direct the water over toward the north side of the stream down stream. Witness states that from a geologists standpoint nothing is permanent, but he would say that the bluff referred to is permanent so far as his life time is concerned. He states that the physical conditions above Turkey island had directed the water to the north channel for thousands of years and that he thinks from his investigation the entire bed was the original channel of the river, without any island at all, and that the island is a temporary structure made of a deposit from the river. He states that the topographical map referred to was the edition of May, 1915, surveyed in 1911 and 1912 under the United States Geological Survey.

At this point the map in question was offered in evidence, and marked Exhibit "B".

580 A copy of Exhibit B is attached at end of and forms part of this statement of facts.

Cross-Examination

By Mr. Taylor:

Witness states that he was on the island December 17, 1915, and that he had never been there before. At the time he states that he considered the river at fairly low stage. Witness states that he took measurements while there with hands levels and figures the comparative elevations with an aliode from the U. S. bench mark. He states that he did not think it was necessary to determine what the stage of tide was that caused the overflow over the floor of the house on the island. He simply knew that the water stood at a level at least four feet above the elevation of the ground at the derrick, from eye measurement around seventeen or eighteen feet above the water level at the present time. Witness states that according to his information of the river seventeen or eighteen feet would be an extraordinary rise along the river. These rises, witness states, have happened several times in recent years, but may not happen for several years—dependent upon the rain fall during the year. Witness states that the adjacent shores north and south are above the high water stage re-

ferred to while the island is not. He also states that the island shows plainly with other stages of high water it would be under water when neither the north or south bank would be. He admits, however, that the water which would go over the island would cover the lowland on the Pawnee County side but for the natural level which protects it. Witness states that he did not make any exact levels of the river level because the river level is something that changes practically every day but he did set his instruments about where the derrick is on the island to ascertain the relative height of the island with the Pawnee county shore. He found that the bank proper was practically three feet higher than on the south side, and considerably higher on the bank on the north side than the island. He states that roughly speaking the island at that point was seventeen or eighteen feet above the surface of the water but he did not take actual measurements. Witness

581 states that he walked along the south side of the river and took a few observations to ascertain its height as compared with the island. He states that in comparison with the island the bank itself was running along higher than the island but that part of the bank is higher than the fields behind it—as stated, the banks acting as a natural levee. He states that while there are places where the island is practically level with the bank, on an average it is three to four feet lower than the bank. Witness states that when the floods are high the water will overflow the main banks and get out through the fields, as indicated, by a channel running through them; in other words, when the water is high enough to go over the island it will go back through the Thomas field on the south side of the river lying between the Pawnee county bank and the bluff. Witness states that he found a sandy deposit on the Thomas farm, and that there is every indication that the river has in the past been much wider than it is now, but not any recent time. Witness states that there isn't any question but that at the time of the Government survey in 1872 the island known as Turkey island was in the river, the trees themselves showing that. He also states that vegetation covers the island as indicated on the map with a few exceptions where the high water channels have washed out a portion of the island. Witness states that he found the map, Exhibit No. 10, in a general way to be correct. As far as he investigated the vegetation as shown on plat, Exhibit 10, is substantially as set forth on that plat. Witness states that he found it to be unnecessary in his investigation to take elevations on various points on the island so as to determine how much of it was above ordinary high water mark, there be-

ing ample evidence in the trees and shrubbery at what level the water stood. Witness states that he never made any computation to show how much acreage there was on the island above high water mark so that his testimony is not given with a view to indicating what the acreage of the island is, that is above the line of vegetation common to that locality. Re-

ferring to the water hitting the bluff on the Pawnee
582 county side above the island, witness states that there has been a gradual wearing of the bank in the past.

He states that the bluff has been made by the river all along and there are places where the road running along the river has been washed out by the river cutting back into the bluff so that you cannot drive along the road at all. Witness states that the general tendency of the current of the river in the early days would be a trifle more to the south than it is at the present time, and the tendency of the south bank on the Pawnee County side of the island would be to deflect the current so that it would force it a little more to the north as years passed. Witness states that he found a newer deposit on the south side of the island than on the main part of the island but that there is a deposit accumulating on the south part and has been for many years past. As to the north shore of the island, witness states that he found it to be cutting away constantly so that according to present indications the north channel at this time is probably at the widest point it has ever been. The south channel, he states, is filling up. Witness states that the last flood, the date of which he does not recall, has literally swept through and torn away the whole south side of the island in places. Witness states that on the south side he found willow and cottonwood trees but no hardwood. Scattered over the island, however, much hardwood timber could be found. Witness states that he took no measurement of the width of the island or any dimensions of any kind bearing on the island itself, nor did he measure the amount of cultivation that had been put in on the island. He saw cleared spaces upon which he was told cultivation had been put in but it was swept away by the last flood. Witness states that the soil on the island, comparatively speaking, is of the same kind that he found on the Thomas farm on the Pawnee County side. So far as the soil is concerned, the land on the clearing on the island would do practically as well as the soil on the Thomas farm. Knowing the Arkansas river
as he does, witness states that he would not attempt
583 to say just what the condition of the two channels referred to was in 1872.

Redirect Examination

By Mr. Ledbetter:

Witness again states that the south bank of the south channel of the river was a natural levee and that running substantially the entire width of the island it is just as high in most places, and a little higher, than the surface of the island. He also states that the south bank of the river is higher than the mainland, is farther to the south, so that the bank of the river constitutes a levee, and when the water goes over the bank it goes over into the mainland. This fact, witness states, is evidenced by a channel going through a man's wheat and corn fields. Witness states that according to the measurements made by him on points on the island he found the south bank on the south side of the channel higher than the mainland of the island by three or four feet, and that the main bank of the north channel is much higher also. He also states that practically throughout the island surface is lower than the south bank of the river but there are places where the island sticks up a little higher, but they are rare. These high portions are around the derrick in the middle central portion of the island. Witness states that there is a very big cultivated place on the island marked on the map "3.75 acres," but he did not undertake to verify it, and that the surface of the island beyond that cultivated land is covered with cottonwood and willow trees, the cottonwood tree appearing to be the commonest tree on the island.

584 **M. L. WALKER**, a witness of defendants and intervenor testified by a deposition taken on the 2nd day of December, 1915 before Alexander Gault, notary public, District of Columbia:

Direct Examination.

Names, **M. L. Walker**, age 46, Major in the Corps of Engineers, United States Army, Professor of Practical Military Engineering, United States Military Academy at West Point, with local rank of lieutenant colonel, graduate of West Point in 1893, immediately after graduation was assigned to duty at Willette point, New York, United States Engineers School of Application, from 1893 to the summer of 1896, taking a course of instruction, for six months was on duty in Boston Harbor fortification construction, four years on duty in Seattle, Washington, engaged primarily on fortification work, with some occasional work in connection with the river and harbor work, two years in Galveston, Texas, on fortification work, four years Washington, D. C., military duty with troops, two

years in San Francisco, military duty with troops, sixteen months in the Phillippine Islands, military duty with troops, two years Memphis, Tenn., in charge of the First and Second Districts of the Mississippi River improvement and of the Engineer District of Little Rock, Arkansas, four years military duty at Fort Leavenworth, Kansas, one year duty with troops and three years at the Army Service Schools, and for the last fifteen months on duty at West Point, New York, as professor of Practical Military Engineering. From December 8, 1908, until about September 20, 1910, being in charge of the Little Rock Engineers Office, witness had supervision of the Arkansas and the White rivers and other streams tributary thereto.

Recollection of witness was that the project of the Government of the United States with regard to the Arkansas River during said time from 1908 to 1910 was the improvement of the Arkansas from Wichita, Kansas to the mouth, appropriations to be expended at such localities as the Secretary of War saw fit between those two extreme points.

Witness was fairly familiar with the Arkansas River from Fort Smith, Arkansas to the mouth and had seen the river at Tulsa, Oklahoma, and Muskogee, Oklahoma. While he was in charge of the Little Rock office, under the river and harbor act of Congress, approved March 3, 1909, witness was directed to make an examination of the Arkansas River between Tulsa, Oklahoma and Fort Smith, Arkansas, with a view to recommendations for its improvement for navigable purposes. Witness made investigation by examining the records existing in the office, by going to Fort Smith and observing the river, by going to Muskogee, Oklahoma and examining the river there, by going to Tulsa, Oklahoma and examining the river there, and by using the personal information in regard to the river of the Assistant Engineer in the office, P. R. Van Frank, Jr., the said Van Frank being still employed as an assistant at the Little Rock office, so far as witness knew. Witness formed an opinion that the river could be rendered navigable between said points. On account of the fact that the appropriation bills for the improvement of the Arkansas River, the general appropriation bills since 1879 have contemplated the improvement of the river from Wichita, Kansas, to the mouth of the Arkansas, witness presumed that the Arkansas River has been considered a navigable stream between those points.

Witness was acquainted with the Hudson River in New York, which he has known to be closed to navigation, and some time between 1889 and 1893 said Hudson River was closed by ice for a period of perhaps two months.

Witness remembered that the amount of water flowing in the Arkansas at various times differs widely, the variation at Little Rock being large.

586

Cross Examination.

While in charge of the Little Rock office, witness had occasion to become familiar with previous reports of officers in charge of that office and of the Chief of Engineers relating to certain parts of the Arkansas River. Witness identified the following statement found on page 377 contained in extract from report of Chief of Engineers to Secretary of War, having reference to the Arkansas River, a report from a part of the annual report, improvement of the Arkansas River and the Cimarron River in Kansas, made by Captain Graham D. Fitch (said statement occurring after referring to acts of Congress previous to 1902):

"Act of Congress approved June 13, 1902, merges these two general projects into one, which makes the existing project in substance, the improvement of the river from its mouth to the head of navigation by snagging operations, by dredging operations and by contraction works, holding the improved channel by revetment when necessary.' "

Same statement was contained on page 399 of report of Chief of Engineers for 1904, relating to Arkansas River; on page 413 of report for 1905; on page 448 of report on said rivers for years 1906. Same statement was contained in a similar report by Captain W. D. Connor for year 1908 and in annual reports by witness for years 1909 and 1910.

The existing project, as shown by said reports up to and including period of official employment of witness at Little Rock, was improvement of Arkansas River from its mouth to head of navigation.

On page 378 of Chief of Engineers' report for year 1903, the following statement was made: "Fort Gibson on the Grand River, two miles above its mouth and 463 miles from the mouth of the Arkansas River, is the head of navigation."

587 The recollection of witness, was that substantially the same statement was made in each and every annual report of the Chief of Engineers subsequent to 1903 up

to and including the time of the services of witness at Little Rock.

Witness had not recollection of any improvement or attempted improvement on Arkansas River above the mouth of Grand during his incumbency in the Little Rock office. In report of Chief of Engineers somewhere about 1880, there is a record of some improvements having been done between Fort Gibson and Wichita. Witness referred to the operation of the snag boat, the name of which he did not know and could not recall whether it was the Wichita or not. Witness had no knowledge or information as to more than one snag boat operating at that time or at any other time before his incumbency. Witness did not know of any other improvements being made or attempted to be made above the mouth of the Grand River other than the operation of this one snag boat.

Witness learned the day before his deposition was taken that the Grand River is sometimes called the Neosho.

P. R. Van Frank, Jr., had been connected with the Little Rock office a long time before witness was there; witness understands he is still there. Witness regards him as a fully capable man in work of that kind (assistant engineer).

Witness said that he stated in his direct examination that in his opinion the Arkansas could be made navigable from Tulsa down, and he had no means of knowing whether it could be made navigable above Tulsa except from information he could get from reading back reports.

The head of navigation, as witness understood it, was the head of actual, not potential, navigation. Boats were actually running, and when he was in the Little Rock office, Ft. Gibson was considered to be the head of navigation and no consideration was had of the expenditure of any appropriations above the mouth of Grand River at that time.

588 Witness said that in his direct examination he stated that appropriations made for improvement of the Arkansas River since 1879, as far up as Wichita, raised a presumption that the Government considered the stream navigable up to that point. Witness was familiar with the act of Congress making appropriations for the Arkansas River; could not say that he was familiar with all of them. Witness had not had occasion to examine acts of Congress making appropriations for improvement of the Arkansas River in years 1902 to 1913 inclusive; that he was not able to state of his own knowledge that the acts of Congress making ap-

appropriations for improvement of the Arkansas River were in the nature of experiments and that after attempts to improve the river above the Grand had demonstrated that the river was not navigable above the Grand, the appropriations were discontinued.

Witness had only seen the bed of the Arkansas above the mouth of the Grand at Tulsa; that he had an idea from reading the reports, but not from personal observation as to the character of the bed of the Arkansas River; that the character of the bed of that portion of the river consists of shifting sand, which makes the channel of the river one of uncertain position.

Witness had never known of any commercial navigation whatever on the Arkansas above the mouth of the Grand. Witness knew of a reference in a certain report of Captain Taber as to a steamboat and several steel barges on the Arkansas River above the mouth of the Grand, but it was simply referred to and witness knew nothing about it beyond the mere reference in that report. Witness had heard that the said steamboat had been sold to the Government, but he did not know whether the report was true or not. Witness was here shown a pamphlet, being the annual report upon the improvement of certain rivers in Arkansas, Missouri, and Kansas, made by H. S. Taber, Captain, Corps of Engineers, 1885, and on page 1611 of said pamphlet, under heading "Continuation of Survey of Arkansas River of Kansas to
589 Fort Gibson, Indian Territory", appears the following statement:

"During the latter part of the fiscal year, a steel steamer with a fleet of five steel barges, none drawing over 12 inches of water, has been put on the river from Arkansas City to Fort Gibson. This changes the whole face of the problem, and I am now securing all the data possible bearing on this new departure. To report fully and submit proper estimates I wish to see the boat visit the southern section of Kansas and secure other data. I believe this boat is designed to produce a revolution in the matter of navigating upper reaches of shallow rivers."

Witness then stated that that was the statement he referred to and that he did not know whether or not the statement was correct about the number of barges and the draft of water. Witness also said that said statement was the only information he had as to any proposed commercial navigation on the Arkansas River above the Grand.

There was considerable fluctuation occurring periodically at a certain time of the year in the volume of water in the Arkansas, but witness would have to consult the records to state definitely. His recollection was that the big fluctuation occurs in the spring, but the minor fluctuations occur irregularly. Witness did not think that the fluctuations occurred at such periods of the year that shippers and [boatment] could depend upon their time of arrival. A channel at ordinary low water is necessary for all year round navigation, but periodical navigation might be a feasible proposition. It would be desirable to provide a channel for navigation purposes at ordinary low water. A channel might be of worth for navigation purposes which was not a channel at ordinary low water. It would depend a great deal on the character of the commerce.

Witness was shown and identified a report made by him dated May 4, 1905, in which occurred the statement,—“There is no navigation on the Cimarron River as it has never been considered a navigable stream.” Witness would have
590 to consult the records at Little Rock as to why he made such statement. According to the records in the Little Rock office, and the opinion of the Little Rock office, the Cimarron was not a navigable stream. The Board of Engineers of Rivers and Harbors concurred in the opinion of witness that the diversion of a portion of the waters of the North Canadian River into the Cimarron River for the purpose of improving the latter river is not worthy of being undertaken by the general Government.

Witness was shown here a pamphlet containing a report of the examination of the Arkansas River from Fort Smith, Arkansas to Tulsa, Oklahoma made by him, dated June 19, 1909, in which occur the following statements:

“Tulsa to the mouth of Grand River, a distance of 65 miles. In this section the river width between banks varies from 3,000 feet to 750 feet, the narrow width being in the lower 2 miles of the section. The average width for the entire section is 1,870 feet. The fall of the river in these 65 miles is 134 feet or at the average rate of 2.06 feet a mile. The ordinary low-water flow of the river at Tulsa is about 350 cubic feet a second; the minimum low-water flow is about 175 cubic feet a second. There are no tributaries between Tulsa and the mouth of the Grand River worthy of note save the Verdigris River, which enters from the north 1 mile above Grand River. At Tulsa the range between high and low water is 16.9 feet, the limiting gauge readings being 18 feet

in May, 1908, and 1.1 feet in August, 1900, in January, 1901, and in September, 1901. The bed of the stream is sand and gravel overlying rock, the latter frequently only 3 to 5 feet below low water. The ordinary low-water channel depths are 6 to 12 inches over the shoals. The general height of the banks varies from 14 to 18 feet in the upper reaches to 20 and 22 feet in the lower reaches.

591 "Second: Mouth of Grand River to mouth of Canadian River, a distance of 37 miles. In this section the river width between banks varies from 2,100 to 800 feet. The average [widty] for the entire section is 1,350 feet. The fall of the river in these 37 miles is 45 feet or at the average rate of 1.22 feet a mile. The Grand River at the head of this section is the most important tributary to the Arkansas River. It, the Grand, has an ordinary low-water flow of 500 cubic feet a second and a minimum low-water flow of 300 cubic feet a second, while the main Arkansas above the Grand and Verdigris rivers has only about 350 and 176 cubic feet a second as corresponding flows. The corresponding flows of the Verdigris are 150 and 25 cubic feet a second. The combined flows of the upper Arkansas, the Verdigris, and the Grand Rivers give for the section between Grand and Canadian Rivers an ordinary low-water flow of about 1,000 cubic feet a second, and a minimum low-water flow of about 500 cubic feet a second. The ordinary range between high and low water is 30 to 32 feet."

Omitting a portion, there then occurs the following:

"Tulsa to mouth of Grand River, 65 miles.—The steep slope, the small low-water flow, and the shifting sands and gravel in the bed of the river preclude any possibility of improving it by means of regulation works so as to afford a channel that would be of any worth for navigation purposes; therefore no estimate for improvement by that method is submitted."

Again on page 7:

"The mouth of Grand River has always been considered as the head of navigation on the Arkansas River, and if there has ever been any commercial navigation of any sort above that point this office has no information of it."

And again on page 8:

"In view of the foregoing and in compliance with the law directing that an opinion as to the worthiness of an improve-

592 ment be expressed, I must report that it is my opinion that the Arkansas River between Tulsa and the mouth of Grand River is not worthy of improvement, and that so long as the river below Fort Smith is not improved to an extent that will give dependable navigable channels there, the river between the mouth of Grand River and Fort Smith is not worthy of improvement beyond the occasional snagging operations provided for in the existing project for the improvement of the Arkansas River."

Witness identified said statements and said his report was approved by the Board of Engineers for Rivers and Harbors and by the Chief of Engineers.

In response to the question,—“Assuming that the facts stated in your report with reference to the Arkansas River from the mouth of the Grand to Tulsa are correct, is it your opinion that the Arkansas River in that section is a navigable waterway of the United States?”,—witness answered “Yes”.

Witness testified that any actual navigation, even if feasible to float logs down a stream, renders the stream a navigable water of the United States, and that he based his opinion upon the feasibility of the Arkansas River above the mouth of the Grand to float logs; that he considered it practicable to float logs on that part of the Arkansas River; that he based that consideration upon the data existing concerning the Arkansas River in the Little Rock office at that time. In said office there was a survey of the river on file, made some years before, with statements as to the flow of water, but he recalled no records of any logs ever having been floated on it, and he had never attempted to navigate the Arkansas River above the Grand and had never personally talked with any person who had attempted to navigate it in that section. To his knowledge, there is no person who has more knowledge of the feasibility of navigating the Arkansas River than P. R.

593 Van Frank, Jr. All rivers known of by the witness zig-zag from side to side, and witness presumed that the section of the Arkansas testified about by him did so. All rivers consist of a succession of bends, with crossings between, and there is usually difficulty in the ordinary river in crossing the bar which usually exists where you pass from one bend to the next. The bed of the Hudson River is not of the same character as that of the Arkansas above the Grand. There was nothing other than what he stated before upon which witness based his opinion that the Arkansas above the Grand is a navigable water-way of the United

States. According to his report, to make the Arkansas navigable from the mouth of the Grand to Tulsa, a system of movable dams was the most feasible method, said dams to be of 8 feet lift and the total initial cost to be \$10,044,000, with annual maintenance of \$541,880. These estimates were made by witness, as all those estimates are made, in response to orders, carrying out the provision of an act of Congress. In opinion of witness, as stated in his report, the Arkansas between Tulsa and the mouth of the Grand was not worthy of improvement, and there was no possibility of improving it by regulation works, instead of canalization, so as to have a channel of any worth for navigation purposes. Canalization means the improvement by means of locks and dams; the regulation works are used where you have a continuous channel. Witness did not regard the improvement of the river from the mouth of the Grand to Tulsa by regulation or contraction works as practicable. The opinion of witness that the Arkansas was a navigable water-way of the United States was based on the fact that that stretch of the river had been included in the appropriation bill from 1879 onward. Whether a river is navigable or not was not, in the opinion of the witness, dependent on the facts that there had never been any commercial navigation upon it, and that it could not be made navigable by regulation works, but might

594 be made navigable by the expenditure of \$10,000,000 initial cost and a half a million dollars annual maintenance in a section of 65 miles. The stream might be naturally fit for a certain class of navigation and yet it might be very expensive to get a different character of navigation thereon. If the section of the Arkansas River referred to in the natural condition and without the aid of artificial means did not afford a channel for useful commerce, witness was of the opinion that that part would not be considered a navigable stream.

Redirect Examination.

As shown by page 4, official Document No. 206, witness submitted three methods of improving the river. First, a method of a fixed dam of 15 foot lift at a total cost of \$3,781,500 and an annual upkeep of \$340,630. Second, a fixed dam of 8 foot lift of total first cost \$6,202,000 and annual maintenance \$350,400. The movable dam with the 8 foot lift was regarded by the witness as the best. Witness was intending to fix the river for the transportation of boats and barges.

Witness was here shown House Executive Document No. 90, 49th Congress, 1st Session, embodying a report on the survey

of the Arkansas River from Fort Gibson to Wichita, Kansas, dated January 23, 1886, and signed H. S. Taber, Captain of Engineers. After identifying said document, witness stated that on pages 2 and 3 of the same appeared the following:

"There is no doubt but that a 2-foot channel can be provided whenever the development of the country warrants it; and the river should be, for all purposes of law, rated as navigable to Wichita, Kans.

"Beginning at Arkansas City, the river may be rated with a large number of rivers now undergoing improvement for the use of light-draught boats, with this exception, 595 that there is now engaged in traffic on this reach a peculiar steel steamer with a fleet of steel barges that draw not to exceed 12 inches of water. This is regarded as a factor which not only simplifies the problem of improvement, but warrants immediate and careful attention, in view of the benefits immediately to accrue. At the proper place this boat will be again referred to."

And the witness also stated that on page 3 appeared the following:

"The plans and estimates, therefore, submitted here are solely for such permanent improvements as shall insure a 2-foot channel at low water, say from 200 to 800 feet wide, as high as Arkansas City."

Witness also stated that on page 4 of said document appeared an estimate of Captain Taber's making the improvements referred to in said document at a cost of \$1,696,900.

Witness was next shown and identified House Executive Document No. 234, 50th Congress, 1st Session. He testified that said document contained an estimate prepared for the improvement of the Arkansas River between Little Rock, Arkansas and Fort Gibson, Indian Territory, and also a report of March 16, 1880, of the Board of Engineers on improvement of Arkansas River, from Wichita, Kansas, to its mouth.

Witness further testified that said document contained the report of Captain H. S. Tabor, dated January 31, 1887, improvement of the Arkansas River from Fort Gibson, Indian Territory, to Little Rock, Arkansas.

Witness testified that on page 2 of said report there appears the following:

“For over two years I have been engaged in personal conversation, as opportunity occurred, with old navigators of the river and old, residents along the banks, and with my
 596 object concealed, have received uniform testimony that in past years the Arkansas River flowed through a much narrower channel, and that then, but for the snags, no boats such as now navigate it had any difficulty in doing so. This testimony is universal. With it before me this method was decided upon, not as new, but as specially applicable to this river.”

In order for a river to be navigable, in the opinion of the witness, it must be actually navigable, but not necessarily actually navigated.

The understanding of witness was that it was the opinion of Captain Tabor that actual navigability of the Arkansas for small craft as high as Wichita was feasible although witness had no personal opinion on the subject.

One reason that witness recommended against improvement between Fort Gibson and Tulsa was that the surrounding country had amply railroad facilities, and it is the understanding of witness that in nearly all parts of the United States, as a rule, the amount of river traffic and transportation has been gradually on the decrease because of the fact of so many railroads furnishing sufficient means of transportation.

On pages 1566 and 1567 of Appendix W to the Chief of Engineers' report for 1905 appears the following statement of appropriation made by Congress for the improvement of the Arkansas River:

(a) ‘July 3, 1832: For improving the navigation of the Arkansas River, Arkansas, Indian Territory, and Kansas (less \$38 carried to surplus fund) \$14,962.00.’”

(b). “March 3, 1835: For improving the navigation of the Arkansas River \$40,000.00.”

(c) “March 3, 1837: For continuing the works \$25,000.00.”

(d) “August 30, 1852: For the improvement of the Arkansas River (less \$269,47 carried to surplus fund) \$39,730.53.”

597 (e) “March 3, 1879: For improvement of Arkansas River between Fort Smith, Ark., and Wichita, Kans. \$20,000.00.

"For removing snags, sand bars, wrecks, and other obstructions, and correcting and deepening the channel on the Arkansas River \$30,000.00."

(f) "June 14, 1880: For improvement of Arkansas River between Fort Smith, Ark., and Wichita, Kans., \$15,000.00."

(g) "March 3, 1881: For improving Arkansas River between Fort Smith, Ark., and Wichita, Kans., \$24,000.00.

"For improving Arkansas River at Pine Bluff, \$33,000.00.

"For removing snags, wrecks, and other obstructions on the Arkansas River \$35,000.00."

(h) "August 2, 1882: Continuing improvement between Fort Smith, Ark., and Wichita, Kans., \$20,000.00.

"Continuing improvement at Pine Bluff, Ark., \$20,000.00.

"Continuing removal of snags, wrecks from the Arkansas River \$35,000.00."

(i) "August 11, 1888: Continuing improvement between Wichita, Kans., and the navigable mouth of the Arkansas River \$150,000.00.

"For removing obstructions \$25,000.00."

(j) "September 19, 1890: Continuing improvement from Wichita, Kans., \$180,000.00.

"For operating snag boats and removing obstructions \$20,000.00."

(k) "July 13, 1892: Improving Arkansas River, Arkansas and Indian Territory, \$250,000.00.

"Removing obstructions and operating snag boats, \$20,000.00."

Said Appendix was to the report of Major Graham D. Fitch, for 1906.

In response to question, witness stated that on pages IV and V of Appendix Q to the report of the Chief of Engineers for 1881, there appears the following:

598 "Arkansas River, between Fort Smith, Arkansas, and Wichita, Kansas (in charge of Maj. Charles R. Suter, Corps of Engineers, to February 1, 1881). The object of this improvement is to remove snags, rocks, and other obstructions to navigation from the Arkansas River, throughout an estimated distance of 350 miles.

"During last season some work was done upon the reach between Wichita and Arkansas City, Kans., a distance of about 50 miles, and preparations were made for providing the work with some suitable appliance for carrying it on during the coming season. A strong light-draught, scow-built steamboat, provided with a crane and other appliances for removing snags, wrecks, &c., is now being built for this service and nearly completed. It is proposed, during the coming season, to continue the work of removing these obstructions to navigation as long as the funds available will suffice. It is thought that this will be for about eight months' work.

"The officer in charge calls special attention in his report to the necessity for continuing the survey of the Arkansas River made in 1879 from Fort Gibson, Ind., to Little Rock, Ark., up to Wichita, Kans. He renews the recommendation made by his predecessor in charge of this work, that \$16,300 be appropriated for this purpose."

Witness further testified that on page 1573 of Appendix Q of the Annual Report of the Chief of Engineers for 1882 appears the following:

"As the resources of the country through which the Arkansas River flows are developed the greater is the necessity for its improvement in order to insure cheap transportation to market for the products.

"This is nature's outlet for the surplus products of a large portion of Western Kansas, Indian Territory and the State of Arkansas.

"The coal interests on the borders of the river in the Indian Territory and Arkansas, which are just now beginning to attract attention, to say nothing of other products, such as cotton, grain, lumber, &c., will soon demand its extensive and permanent improvement.

599 "The removal of snags and other obstructions of a like character are of course very beneficial to navigation and very necessary, but under existing circumstances it can afford only temporary relief, which must be continued from year to year until some radical improvement is effected.

"The time has now come when it would be advisable to take in hand the subject of the permanent improvement of the Arkansas River throughout its navigable extent from Wichita, Kans., to its mouth."

This language just referred to is taken from the report of Thomas H. Handbury, Captain of the Corps of Engineers in charge at Little Rock during the year 1882.

Witness stated that according to his recollection he had never been nearer the Cimarron River than when he was at Tulsa, although he might have crossed it sometimes on the railroad train. The recollection of witness at time of answering was that in making a report as to the Cimarron, the sole matter under consideration was the advisability of deflecting a portion of the waters of the North Canadian into the Cimarron.

The understanding of witness as to what fixes whether a river is navigable or not is the fact that it is navigable, whether it is absolutely being navigated at the time or not.

Transportation on the Missouri River went down to practically nothing several years ago, and steamboat transportation, both through and local, on the Mississippi River has diminished.

WILLIAM KELLY, witness for defendants, testified by deposition taken on the 3rd day of December, 1915, before Alexander Galt, notary public, District of Columbia, as follows:

Name, Major William Kelly, 38 years of age, on duty in the office of Chief of Engineers since July 1913, assistant on the river and harbor work. Records of the office of the Chief of Engineers concerning applications for bridges across navigable waters of the United States are under the con-
600 of any officer in the office of the Chief of Engineers that has occasion to refer to them. Witness had in his possession the records of the office of the Chief of Engineers concerning applications for bridges across the Arkansas River in the State of Oklahoma, formerly Indian Territory. In 1890 Congress first passed an act requiring permission to be obtained for building bridges across navigable waters of the United States where said waters extended in more than one State. Another act on the subject was passed by Congress in 1899.

The first application for the building of a bridge across the Arkansas in its upper portion, in the vicinity of Fort Gibson and above, was dated June, 1901 and was made by the Ozark & Cherokee Central Railroad Company. The War Department granted a permit for the building of the bridge, under an

act of Congress. There was a bill authorizing the erection of this particular bridge which became an act and was signed and approved by the President on February 20, 1902. Said bridge is located in the northwest quarter of Section 21, Township 15 north, Range 19 east, Indian meridian. Application for a bridge across the Arkansas near Muskogee was made in April, 1911 by Muskogee & Fort Gibson Bridge Company, said bridge to connect the town of Muskogee and Fort Gibson. Said application was granted. There was a special act of Congress approved August 16, 1911 authorizing the erection of the bridge. Said bill authorized the Muskogee and Fort Gibson Bridge Company to construct, maintain and operate a bridge and approaches thereto across and over the Arkansas River at a point suitable to the interests of navigation at or near the City of Muskogee, Muskogee County, Oklahoma, in accordance with and subject to provisions of an act entitled "An Act to regulate the construction of bridges over navigable water, approved March 23, 1906." The next
601 application made to the War Department was by the St. Louis & San Francisco Railroad Company on September 17, 1912 for the re-construction of that railroad company's bridge at Tulsa, Oklahoma. The original bridge was built without a permit from the War Department, either before the general bridge act or else built as an illegal structure. Under such circumstances the Department is unable to grant a permit for reconstruction or modification of an existing bridge, the bridge law requiring the approval of plans prior to any construction work. Consequently it is the practice of the Department in such a case to examine the plans and in case there is no interference with navigation or other objection to the bridge, to withhold its objection to the work being carried on, always reserving the right, which it has under the law, to proceed against the bridge should it at any time become an obstruction to navigation. That was the action in this case. On November 5, 1912, Edward Burr, Colonel, Corps of Engineers, Acting Chief of Engineers, wrote the Secretary of War as follows:

"Application is made in accompanying letter by the St. Louis & San Francisco Railroad Company for approval of plans for the reconstruction of an existing bridge across the Arkansas River at Tulsa, Oklahoma. No record has been found of the approval by the War Department of plans for the construction of this bridge. In view of the report of the district officer that the proposed work will not unduly interfere with navigation it is recommended that he authorized to inform the applicant that the War Department will inter-

pose no objection to the reconstruction of the bridge in accordance with the plans presented. It is further recommended that the applicant be informed that this waiver of objection on the part of the War Department shall not be construed as a relinquishment of the right to require the applicant to make in the future at its own expense any alteration of said bridge which in the judgment of the Secretary of War may be required in the interests of navigation, also that the applicant may be liable in damages for any injury inflicted upon private interests by reason of such work."

602 The recommendation in said letter contained was approved by Robert Shaw Oliver, Assistant Secretary of War, November 7, 1912.

No draw is shown in the plans of said bridge at Tulsa.

Witness here read into the record copy of the letter written by Major F. M. Markham, the district engineer officer in charge of the Little Rock Engineer District, to M. C. Byers, Chief Engineer Operation, Frisco Lines, Springfield, Missouri, which is as follows:

"Referring to your letter of the 17th ultimo enclosing for the action of the Department thereon plans for the reconstruction of your bridge over the Arkansas River at Tulsa, Oklahoma, I have to inform you that I have been authorized to state that the War Department will interpose no objection to the reconstruction of the bridge in accordance with the plans submitted, one copy of which is enclosed herewith. This waiver of objection on the part of the War Department is not to be construed as a relinquishment of the right to require the St. Louis & San Francisco Railroad Company to make in the future at its own expense any alteration of this bridge which, in the judgment of the Secretary of War, may be required in the interest of navigation, nor is it to be construed as relieving the railroad company from liability for damages for any injury inflicted upon private interests by reason of such reconstruction."

Witness testified that said Major Markham at the time he wrote said letter had jurisdiction over the Arkansas.

Another application was filed by the Board of County Commissioners of Tulsa County, Oklahoma, dated July 10, 1915 for approval of the plans for a bridge to be built across the Arkansas River at Tulsa, Oklahoma. This application was not granted, the applicants being informed that a permit could

not be issued by the Department until applicants had secured special legislation from Congress authorizing the construction of the bridge in accordance with the laws of the United States. Witness read into the record a copy of the letter written by him to the Secretary of the Chamber of
 603 Commerce, Tulsa, Oklahoma, dated November 6, 1915, reading as follows:

"Office Chief of Engineers,
 Washington, November 6, 1915.

Mr. E. O. Tilburne, Secretary, Chamber of Commerce,
 Tulsa, Oklahoma.

Dear Sir:

Referring to your letters of the 25th ultimo to the Secretary of War and the Secretary of the Navy, respectively in regard to a bridge proposed to be constructed across the Arkansas River at Tulsa, Oklahoma, I beg to inform you that the Arkansas River is a navigable waterway of the United States and is what is termed an interstate stream, being navigable in more than one State. In view of this fact the first requisite necessary to the erection of a bridge there over is an act of Congress authorizing its construction in conformity with the provisions of Section 9 of the river and harbor act of March 3, 1899.

Application was recently made by the Commissioners of Tulsa, County, Oklahoma, for approval of plans of a bridge proposed to be built across the Arkansas River at Tulsa, Oklahoma, but in the absence of the congressional authority for its construction the Department declined to take action on the plans, and the county authorities have been so advised.

By direction of the Chief of Engineers,

Very respectfully,

(Signed) W. KELLY,
 Major, Corps of Engineers."

So far as witness knew, it had been the holding of the War Department since July, 1913 that the Arkansas River from Wichita, Kansas to its mouth, where it empties into the Mississippi River, is a navigable river of the United States. Witness believed that the action of the Department upon the bridges he mentioned was upon the theory that the Arkansas was a navigable river.

When Congress makes an appropriation for the improvement of a waterway, the War Department treats said waterway as a navigable river or stream.

604

Cross-Examination.

The plans for the reconstruction of the Frisco bridge at Tulsa called for a high water clearance of 5 feet, 4 inches and an extreme low water clearance of 24½ feet. The term "Upper Arkansas River", as used by witness, means the Arkansas River above its junction with Grand River.

So far as the witness knew, the records of the War Department show that the Arkansas River has been held by the War Department to be a navigable stream from its mouth to Wichita, Kansas. Witness had never seen anything in the record to lead him to suppose that the Arkansas River had been treated as a navigable stream above Wichita, Kansas.

Witness was not authorized by the Secretary of War [of] the Chief of Engineers to state what is holding of the War Department on the subject of the navigability of the Arkansas from its mouth to Wichita, Kans.

E. H. CROWDER, a witness for the defendants, by deposition taken on the 2nd day of December, 1915 before Alexander H. Galt, notary public, District of Columbia, testified:

Name, E. H. Crowder, Judge Advocate General of the Army about five years, since February 14, 1911; part of duties of witness as Judge Advocate General to give legal opinions when requested to the Secretary of War and the Chief of Engineers.

Witness was here handed and identified a copy of an official opinion rendered by the office of the Judge Advocate General and signed by witness on September 27, 1915, said official opinion having been rendered to the Secretary of War. Said opinion, witness testified, set out the position of his office in

the question of the navigability of the Arkansas River above the Grand River. Said opinion reads:

605 War Department, 30010-8 W. D.
 Office of the Judge Advocate General, Arkansas River.
 Washington, September 27, 1915.

Memorandum for the Secretary of War:

Subject: Position of the department on the question of the navigability of the Arkansas River above Grand River.

1. The Acting Attorney General (Solicitory General Davis) in his letter to the President of September 3, 1915, says it seems to him that the Secretary of War has misconceived the purpose of the suits in question which is to establish as against the State of Oklahoma and its lessees, the title of certain Indians to the bed of the Arkansas in this particular locality by maintaining that the Arkansas is not navigable above the mouth of the Grand River; that the establishment of that fact would not impair the rightful jurisdiction of the Federal Government over the navigable reach of the river, inasmuch as in order to preserve that navigability the Government is entitled to the unrestricted flow of the water in the upper and unnavigable reaches (citing United States vs. Rio Grande Irrigation Company, 174 U. S. 690, 698, in which the Supreme Court held that the Government is entitled to the undiminished flow of the river in its non-navigable section in New Mexico in order to protect the capacity of the navigable reach below), and says: "The present case of the Arkansas is exactly parallel in this respect to the case of the Rio Grande."

The Acting Attorney General also gives it as his view that it is not within the province of Congress to declare a stream to be navigable which is not so in fact, and, besides, that the records of the War Department have always shown, so far as his department can find, that the Arkansas is not capable of being navigated above Grand River; that it appears
 606 doubtful from the reports of the War Department engineers whether the section above Grand River could be made practically navigable by the expenditure of any sum of money, and that even if it could be thus made navigable, that possibility does not constitute navigability with respect to Federal jurisdiction over navigable waters or the ownership of river beds, but that on the contrary the rule established by many decisions of the Supreme Court is that in

order to hold a stream navigable it must be navigable in fact, which depends upon whether in its natural condition it affords a channel for the use of commerce of a substantial and permanent character. He also says that in the case of *Kansas vs. Colorado*, 206 U. S. 46, 86, the Government intervened and relief mainly upon the records of the War Department and took the position that the Arkansas River is not now and never was practically navigable beyond Fort Gibson (on the Grand River) in the Indian Territory, and that the engineers of the War Department assisted the Department of Justice to maintain its position in that case.

2. In view of these considerations the Acting Attorney General says there appears to be no controlling necessity for the Secretary of War to maintain a decided stand in this matter. "A passive attitude on his part," he says, "would relieve this department of present [embarrassment] and leave the War Department free to exercise its full jurisdiction in any possible future event." But his idea of passivity is sufficiently indicated by his suggestion to the President that the department take the following affirmative action:

(1) Recall the letter of October 11, 1911, in which the department expressed the views that this particular reach of the river is navigable, and substitute therefor a statement that the records of the department show the head of navigation on the Arkansas to be at the mouth of Grand River. This he says, is simply to be a statement of fact.

607 (2) Failing this, might not the Secretary detail some competent official of the engineering bureau to make an examination of the records and testify concerning them.

(3) Might not the Secretary, in any event, detail one or more engineers experienced in work on navigable waters and well acquainted with the Arkansas, to make examinations as to present conditions and as to certain physical features not sufficiently covered by former examinations for the purposes of those cases, and testify as to the results. He then adds that as he understands the Secretary of War's letter, the Secretary does not object to the employment of his experts if they are not called upon to explain the policy and the opinion of his department on the question at issue.

3. Of course the sole interest of the Secretary of War is to guard those matters committed to his care. That the Government has jurisdiction over the stream flow in the non-navigable reaches of a navigable stream, so far as is necessary to

protect the navigable portion below, is true (Rio Grande case), but, however, viewed, that would not justify the department in aiding in the establishment of what it believes to be an erroneous finding, hurtful to Federal jurisdiction. It ought not to help to put the label of non-navigability on a waterway which appears to the department to be clearly navigable. The jurisdiction in the two cases is not of the same character. Jurisdiction over non-navigable reaches is not a jurisdiction operating directly upon navigation—full, affirmative and complete—it is rather an incidental jurisdiction conferring the police function of preventing whatever would endanger the flow in the navigable portions farther down. Such jurisdiction is distinguishable from the affirmative function of the Government to foster and promote commerce and therefore to improve and develop the facilities and extend the limits for navigation. On the physical facts, however, the engineer department does not find that “the present case of the Arkansas is exactly parallel in this respect to the case of the Rio Grande”, but rather that the Arkansas in this reach

608 has a natural channel for commerce capable of use, and that any barriers or obstructions that may be found to render navigation somewhat difficult are such as would yield to artificial aid and improvement. The fact that such aids need to be resorted to, or that the stream is not navigable at every point, does not destroy the quality of navigability. St. Anthony's Falls Water Power Co. vs. St. Paul Commissioners, 168 U. S. 349, 359; The Montello, 20 Wall. 430. Kansas vs. Colorado did not involve the question of navigability of the Arkansas in Kansas. The Department of Justice placed its ground of intervention, not upon the theory of navigability, but upon a “New Nationalism” doctrine of “a supposed superior right on the part of the national government to control the whole system of the reclamation of arid lands.” In that case, the Department of Justice asserted that “the Arkansas River is not now and never was practically navigable beyond Fort Gibson,” but the Chief of Engineers informs me that he finds no office record to show that this department aided in the assertion of that view. I know of nothing that the department did in that case to conclude it now from following what appears to be a settled department view.

4. I can not find that the Supreme Court has in so many words ever held what the Secretary of War in his letter said it had held, that

"If the Congress has with respect to such a stream treated it as if navigable, * * * this is determinative upon the question of fact."

On principle I can not see, however, that it could be otherwise, and the decisions of the Supreme Court as to the absolute power of Congress over the whole subject of navigation fairly indicates the correctness of that view. If navigable rivers are, for commercial purposes the property of the Nation and subject to all requisite legislation of Congress; if the power of Congress to control, improve and extend the navigability of a stream is a "great and absolute power;" if all means having some positive relation to the end in view which are not forbidden by some other clause of the Constitution are admissible; if Congress may make an unlawful structure lawful and a lawful structure unlawful "the element of contract out of the way"; if it may determine beyond question the quantity of water in a river necessary to navigation and if the determination by Congress in all these respects leaves no room for judicial inquiry, as is well established, then by analogy Congress can not be denied the right to regard the reach of this river in question as navigable and proceed to its improvement. If such legislative action is ever judicially reviewable, it must be on the ground it is purely arbitrary and without reasonable relation to a legitimate end. Can it be said that Congress, having in this respect all the power of the sovereign states prior to the Constitution, can not make a declaration having higher legal value than mere judicial notice, or an equity court's finding of fact, or the verdict of a jury could [possible] have? If not, then the determination of the scope of exercise of one of the greatest National powers must be left to the necessarily varying and conflicting decisions of courts and juries in questions which involve nothing more than individual property rights. Of course in the absence of such a legislative declaration, or legislative action equivalent thereto, the "fact" of navigability must be judicially determined. I can find no authority, however, holding that a legislative determination of the fact of navigability of a stream, or a certain section thereof, is not conclusive of judicial inquiry. Hurst. vs. Dana, 122 Pacific 1041, and State vs. Akors, 140 Pacific 637 (Kansas), holding that the Arkansas is navigable in Kansas and that the public acts and declarations constitute determinative factors of navigability, are interesting and informative in this connection.

5. However all this may be, I can not see how this department can properly do what the Department of

Justice wants it to do. If the letter of October 11, 1911, be recalled a statement of fact can not be submitted to the effect that "the records of the department show the head of navigation to be at the mouth of Grand River." Of course nobody could make this statement as a fact unless he believed it to be so, and it is the view of the Chief of Engineers, the immediate custodian of the records and the head of the technical bureau dealing with matters of navigable waters, that the records do not indicate that the head of navigation is at the mouth of Grand River, and a different view seems impossible from what I have seen of the records. The Department of Justice, however, thinks otherwise. However, what the records may or may not show, if that be competent, is not for this department nor the Department of Justice to say, but for a court or jury. The department has already furnished all records requested and will, I assume, furnish any others that may hereafter be requested.

Of course the Secretary of War can "detail some competent official of the engineering bureau to make an examination of the records and testify concerning them," if that be a competent method, but I should think that the Chief of Engineers or one of his assistants in the office in which the records are, would be the competent witness for that purpose, and I have just indicated the view of the Chief of Engineers, which presumably is something more than a personal view but the view of his bureau. So also, the Secretary of War may "detail one or more engineers experienced in work on navigable waters and well acquainted with the Arkansas to make examinations as to present conditions and as to certain physical features," but testimony after such an examination would seem to be of far less value than the testimony of those officers who have been in charge of this very river for a number of years 611 and who have observed its cycle of changes running through a long period of time. The Chief of Engineers has communicated with all such officers who are now accessible and they have notified the Chief of Engineers that from their knowledge of the river they would have to testify that it is navigable. Under all the circumstances I, like the Chief of Engineers, do not see how the War Department can honestly hold any other view or express any other opinion than that this particular portion of the Arkansas River is a navigable waterway of the United States.

6. The Acting Attorney General, in concluding, says, "As I read his (the Secretary of War's) letter to you, the Secretary does not object to the employment of his experts if they are

not called upon to explain the policy and opinion of his department on the question at issue." It is apparent to me that the Acting Attorney General throughout fails to understand the position of this department but conceives that that position is based upon a mistaken idea of public or departmental policy. This is not the case. It is the settled view of the War Department that the Arkansas River between Fort Gibson and Arkansas City is a navigable waterway of the United States. This is not based upon any ulterior consideration, but it is a sincere conviction resulting from a knowledge and consideration of physical facts reported from time to time and over a great number of years by engineers of this department whose duty it is to make such reports.

(Signed) E. H. CROWDER,
Judge Advocate General."

Cross-Examination.

On his cross-examination, witness was asked the following questions, to which he made the following answers:

"Q. You state, General, in one place in your memorandum for the Secretary of War, that the case of Kansas vs. 612 Colorado did not involve the question of the navigability of the Arkansas in Kansas. Have you examined the pleadings in that case to ascertain whether or not that issue was involved?

A. I am somewhat embarrassed in answering that question for the reason that I am not aware of any probative force which my opinion can possibly have in this case. In that connection I wish to say that my opinion does not govern the action of the Secretary of War. His decision can be made without conferring with me at all. He was entirely competent to take final action on this case without any reference to the legal department. What I have spoken to him in this case is by way of advice, and therefore I do not understand how the question asked can elicit from me anything of probative force in this case.

Q. In your memorandum you cite two decisions rendered by the Supreme Court of Kansas, Hurst vs. Dana, 122 Pacific 1041, and State vs. Akers, 140 Pacific 637 (Kansas) holding that the Arkansas is navigable in Kansas. Have you examined those decisions and is that your personal conclusion as to the holding of those decisions?

A. I answer it as above, as I have already answered in regard to that case; and I further desire to say this, that I do not think this examination can properly take a form which re-

quires me to state the use or misuse of authorities that I may have cited in a legal opinion given in the course of my official duties, nor to be examined upon the correctness or incorrectness of any view that I have expressed. In other words I will not be drawn into a legal discussion of the sufficiency or insufficiency of my reasoning or my use of authorities in that case.

Q. With the most positive assurance, General, that it is not my intention to embarrass you in any way whatever, and with the assurance that I am very sorry indeed if you do not consider yourself at liberty to answer further questions, still in the performance of my duty as a representative of the Department of Justice in these very important cases, I want to ask you further.

613 A. Let me answer there, I do not base my refusal upon the lack of liberty; I simply question the propriety of calling upon an officer who occupies the relation I do to defend the advice he has given to the Secretary of War when it has not been shown to be the basis of any action by the Department.

Q. Would you assume a different attitude, General, if I should show you that it has become the basis of action by the Department?

A. If you should call the Secretary of War and he should so testify it might appear to me in a different light; but, as I stated in the beginning, I can not understand how my opinion as a law officer of this department has any probative force in respect of any issues that it is possible to raise in this case."

Witness stated in answer to question that he was not able to designate at that time the records of the War Department that he had seen in connection with his memorandum to the Secretary of War; that the records do not indicate that the head of navigation is at the mouth of Grand River.

Witness, in answer to question, stated that he did not know that the memorandum for the Secretary of War which was signed by him on September 22, 1915, in connection with another memorandum signed by the Chief of Engineers, was made the basis of a communication by the Secretary of War to the President in which he expressed the view of the Department as to the navigability of the Arkansas River above the mouth of Grand River. Witness did not know of his own knowledge that the Secretary of War had written a letter to the President dated September 30, 1915, in which letter he stated his view as to the navigability of the Arkansas River above the mouth of the Grand and made a statement that he

had caused the matter to be re-studied by the Chief of Engineers and by the Judge Advocate General and that he enclosed copies of the reports made to him by the Chief of Engineers and by the Judge Advocate General after such careful
614 re-study of the matter. Witness further stated that he had not personally seen the letter written by the Secretary of War and that the Secretary of War had not told him, witness, that he was influenced by the opinion of witness. Whatever views were expressed in the letter of the Secretary of War to the President were certainly the personal views of the Secretary of War.

615 GEORGE A. O'CONNELL, Cleveland, Oklahoma, testified as a witness for the defense, on direct examination by Mr. Freeling, as follows:

Witness states that he has lived at Cleveland since about the middle of April, 1915, and before that time he lived at Osage on the Pawnee—Osage lease. This lease was held at the time by Judge James R. Armstrong in whose employ witness states he is. He states that he is acquainted with Turkey Island and that the lease that he is working on now includes the river bed up against both sides of the island. Referring to the map, Exhibit No. 10, witness states that the lease is one mile each direction on each side of the range line—Secs. 25 and 30. Witness states that he knows where the Quapaw Pipe Line Company has a line. He further states that during 1915 he observed high water in the river, the river having been up continuously all summer, but there were five rises, and at one time it nearly reached over the second bank. This, he arrived at from the mark left on the building. The dates that he observed high water in the river this year were on the 29th of April, 26th of May, 8th of June, 28th of June and 16th of September, the water reaching its highest point on May 26th, 1916; he states on that date and for over nine days there was water almost up to the second bank on the north channel where they had their boats tied. He states they went to all points of the north channel in boats. They went to a point marked "well" on Exhibit 10. The water at the time was up over the well about ten or fifteen feet. Witness states that the water did not go over the bank at the house where the well is marked on the map though the water completely covered the island with the exception of about two or three acres at most. This uncovered area on the island was about four hundred feet west of the well where it is marked "old well". At that time the water broke over the second

bank of the shore line across the north bank of the north channel in two places, one place about a thousand feet east
616 of the range line, and the other place a little more than half a mile up. At the places where it broke over the water crossed over the railroad, went under the bridge and washed out the bridge towards Tulsa, and it also went north over the creek and went over the railroad track. After the water went down witness states he went over to the island to take a look at it. He found that the sand or deposit from the river had covered pretty nearly all of it. He also found that the water had gotten into the well which stands about eighteen inches above the ground level. While there was no water in the well when he got there, the sediment and refuse indicated that it has been there. At other times of high water witness states that the island has been pretty near all covered. He states that an old fellow who lives on the island had to move off three times on account of the water flooding into his house. This man's house, witness state, was located on the island about two hundred feet east and a little south of where the oil well is marked on the plat, about one hundred feet from the bank of the island. Witness states that the water reached a height in the man's house of about two feet and that during last year he had moved three times. The time that the high water caused this man to move out, the condition of the water on the opposite bank of the north channel was almost up to the bank and witness states it was over his wells. That was on the 26th of May; another time it was up to about three feet of the top of the bank. Witness states, during these rises in the river he never observed the water backing over the second bank at his well on the north shore line of the north channel except at the point mentioned by him heretofore. He states, five times he observed the island almost wholly submerged, and for a week at a time he couldn't get over to the island on account of its being submerged. After these rises the sediment would deposit itself upon the island. Witness states that while the island appeared from looking at it with the eye to be under water when he went over to look at it he saw that it wasn't entirely submerged. Witness states that the man who lives in
617 the house on the island is named Jack Sharp, and while he is sick with pneumonia, would probably be all right in case he was needed as a witness. Witness states that before this last flood he thought that Sharp's house was on as high a ground as any on the island but he finds the highest place is a little northwest of that point, and at the

time he observed the water two or three feet deep in Sharp's house, it was above the ground about three feet.

Cross Examination

By Mr. Taylor:

Witness states that the house that he stayed in was located on the north or Osage side of the river from the island about one hundred and fifty or two hundred feet from the present water. The tool house was lower down on the first bank, and during high rise of May 26th, the water was up in it seven feet. In his opinion, witness states that the rises during the past year were extraordinary ones, and the one of May 26th was the biggest rise he has known of. In two places in his neighborhood it covered the M. K. & T. railroad tracks, it also went over the bottom land on the farms on the Pawnee County side, including the Thomas farm. He states, however, that during this highest rise there were two or three acres of inland that was not covered. He also states that he did not go on to the island during any one of these rises as he was afraid to. Witness states that the river across the north channel is about eight hundred feet wide. He states that the island is covered with timber and undergrowth such as are characteristic of that locality and the water that he saw was water that overflowed the grass and underbrush during these extraordinary rises. Witness states that he has only been familiar with the river since the 16th of January 1915. He states that Judge Armstrong owns the lease that is involved in this litigation, and this lease includes the river bed around the island, and that he is in Armstrong's employ.

Witness states that during rises in the river, other than
618 the one of May 26th, there may have been ten acres left clear, looking at it from a distance. Witness states that the river was out of its natural banks a number of times during the rise of May 26th but that was an exceptionally big rise, going up to seventeen feet three inches; the other rises he judged were about fourteen feet on an average, three feet lower than the big rises. Witness states that he is not a civil engineer but he has measured with a level to find out how high the rises were. At this point, Mr. Kearful called the court's attention to the fact that the dates which the witness gave upon which the water was highest correspond precisely with the hydrograph which the Government introduced, which hydrograph shows the rises and falls of the river during the year 1915, and also for many preceding years.

Re-direct Examination

By Mr. Freeling:

Witness states that it is not necessary to be an engineer to tell when the island is covered with water. He states that island was substantially submerged at times when the water did not break over the north shore line of the north channel, and that he never saw the water break from the north line at any time except on the 26th of May, 1915. Witness states that when Sharp, who lived near the well on the island had to move out because of high water he came over to his place and bunked in one of the [took] houses on the bank near the section line on the north bank of the north channel. This tool house, witness states, was Not under water but he had one down in the river bed that was.

Defendants here introduced the following two letters proved by testimony of Isaac D. Taylor in Nolegs case and in this case as hereinafter shown, to be part of official records of office of United States District attorney for Western District of Oklahoma. The first letter is defendant's Exhibit "C" and reads:

619

War Department

October 11 1-14 P. M. 1911

24661

Washington

Oct. 11, 1911.

Sir:

Referring to your letter of 25th ultimo, requesting War Department view as to the navigability of the Arkansas river in Osage County, Oklahoma, I beg to inform you that it appears from a report of the engineer authorities that said river at the locality mentioned is a navigable waterway within the purview of laws enacted by Congress for the preservation and protection of such waters and of decisions by the Supreme Court of the United States on the subject, and the Department has uniformly so held.

Very respectfully,

ROBERT SHAW OLIVER

Acting Secretary of War.

The Honorable

The Attorney General."

The second letter reads:

Department of Justice.

Washington.

October 18, 1911.

John Embry, Esquire,
United States Attorney,
Guthrie, Oklahoma.

Referring to your letter of the 18th ult. requesting certain information from the War Department relative to the navigability of the Arkansas River in the vicinity of Nolegs Island, Oklahoma, there is enclosed herewith a letter dated October 11, 1911, from the acting Secretary of War in which he states that the War Department has uniformly held that the river is navigable in the locality mentioned. A copy of Department letter of the 26th ult., requesting the information from the War Department is also enclosed.

Respectfully,

For the Attorney General,

ERNEST KNAEBEL,
Assistant Attorney General."

Said two letters were identified by said witness, Isaac D. Taylor, as Exhibit JJ 2843, and the envelope from which he took said two letters was identified as Exhibit "KK".

Defendants offer in evidence the deposition of DAN CHRISTIE KINGMAN, which is read as follows:

620 Dan Christie Kingman, witness for defendants, by deposition taken on the 3rd day of December, 1915 before Alexander Galt, notary public, District of Columbia, testified:

Name, Dan Christie Kingman, for a little over two years past Chief of Engineers, United States Army, War Department, and for forty-five years had held the positions of Colonel, Lieutenant Colonel, Major, Captain, First Lieutenant, Second Lieutenant and Cadet at Military Academy.

Witness acquainted with the holding of the War Department of The United States as to whether or not the Arkansas River in Oklahoma is a navigable river under the laws of the United States. The holding of the War Department is

that said river in Oklahoma is a navigable water of the United States.

Witness had never know of any holding of the War Department or of any official action taken by the War Department contrary to the position that the Arkansas River in Oklahoma is a navigable water under the laws of the United States.

Witness was shown and identified copy of "Memorandum for the Secretary of War" dated September 10, 1915, and stated that said instrument was prepared under his direction and signed by him and expressed his views as Chief of Engineers of the United States Army. Said memorandum reads:

War Department
Office of the Chief of Engineers,
Washington.

30010-8 W. D.

September 10, 1915.

Memorandum For
The Secretary of War.

Subject: In the matter of the navigability of the upper Arkansas River.

1. Very few rivers are susceptible of safe and convenient navigation at all times and all seasons. On almost all
621 of them navigation is impeded or prevented at certain times due to various natural causes. Navigation may be interrupted by ice, by the force and violence of freshets, or by extremely low water due to periods of draught. The navigability, therefore, can not be determined with certainty by an examination made at any particular time. No examination could be regarded as reliable that did not cover a complete cycle of changes.

2. Navigation upon the Hudson River is prevented for about 3 months in the year on account of ice; upon the Detroit River, which has the greatest commerce of any river in the world, navigation is prevented for about 5 months in the year for the same reason, and upon the Yukon River, which has a navigable length of about 2,000 miles, navigation is only possible for 5 months out of the year, but no one would question the fact that these are navigable waters of the United States.

3. Upon other rivers navigation is impeded or entirely prevented during periods of draught. This is true of the Ohio River, the Tennessee River, the upper Mississippi, the Arkansas, the Savannah, and many other rivers as they were in their natural condition. But at other times when the discharge of the river is greater, navigation is possible, and the streams are such as to lend themselves to the purposes of interstate commerce.

4. It is not the use of the river which determines the question of its navigability, but it is its susceptibility to such use. A river flowing through a heavily timbered country will usually be made use of for the transportation of timber and forest products, and very useful navigation can be carried on by means of rafts. Another river of precisely similar size and regimen may flow through a treeless country and not be used at all because the material to be transported is not there. This would not, however, determine the fact whether it was or was not a navigable waterway of the United States.

622 5. That portion of the Arkansas River lying between Fort Gibson and Arkansas City is undoubtedly susceptible of navigation at high and intermediate stages. This is evidenced by the fact that steamboats have actually passed over it. Whether it is or is not used for the purposes of navigation and commerce during the periods when it might be so used would naturally depend upon the other means of transportation available, upon the character of the people which occupy the valley, and upon the nature of the articles of commerce which they produce or consume.

6. Congress has made forty-three appropriations of money for the improvement of the Arkansas River, amounting in the aggregate of \$3,145,929.60. In eight separate cases the law has specifically named the town of Wichita, Kansas, as the upper limit of improvement, and in the formal project, as set forth in House Document 90, 49th Congress, 1st Session, Wichita, Kansas, is also fixed as the upper limit. In this same document General John Newton, then Chief of Engineers, stated in his opinion that much relief would be given to navigation at high and medium stages of the river between Fort Gibson and Arkansas City by the expenditure of about \$20,000 for the removal of obstructions and the building of dikes. This covers the portion of the river under consideration, Arkansas City being in Kansas above any portion of the

river lying in Oklahoma. In the report of the Chief of Engineers for 1885, on page 1611, it says:

'During the latter part of the fiscal year a steel steamer with a fleet of five steel barges has been put on the river from Arkansas City to Fort Gibson.'

7. In compliance with an item in the river and harbor act of March 3, 1909, an estimate was made of the cost of improving the river from the mouth of Grand River sixty-five miles up-stream to Tulsa. While the project was feasible, the expenditure involved was not considered to be justified at the time. The reservation in question on the Arkansas River is in the county adjacent to Tulsa.

8. The following is a list of the officers which have been connected with the improvement of the Arkansas River since 1875. Among those will undoubtedly be found the ones best capable to testify from personal knowledge as to its character. Those marked with the cross are dead. Of the others, Major Suter, Captain Palfrey, and Captain Fitch are retired from active service. Lieutenant Sibert has since been promoted to the grade of general officer. The post-office addresses of all of the living officers will be found in a book published monthly by the Adjutant General's office entitled "Army List and Directory." Of all the living officers I consider Major M. L. Walker best competent to testify in regard to this section of the river, because he was in charge of the work for nearly 2 years, and during this time he made a personal examination of the section under consideration. Next to him I consider Major C. S. Smith would be the best witness, and next to him Major E. M. Markham, who is at present in temporary charge of the work. In response to a telegram Major Walker wires on September 9 as follows: 'I consider Arkansas River from Arkansas City to Fort Gibson a navigable water of the United States. This is from personal knowledge of the river.' At the same time Major Smith telegraphs in response to inquiry: 'Arkansas River is navigable waterway of the United States between Arkansas City and Fort Gibson.' I do not know what the opinion of Major Markham is on this subject. I wired him but have received no reply. Certified copies of the records of the office relating to this subject have been furnished to the Department of Justice. In view of the foregoing

624 I do not see how the War Department can honestly hold any other view or express any other opinion than that this particular portion of the Arkansas River is a navigable waterway of the United States:

List of Officers stationed at Little Rock, Ark., from 1875 to date.

<u>Name</u>	<u>From.</u>	<u>To.</u>
	X	1875, February 1, 1881
Maj. Chas. R. Suter (at St. Louis)		
* Capt. Thos. H. Handbury	x Feb. 1, 1881,	December 11, 1883.
* Capt. M. B. Adams	..... Dec. 11, 1883,	July 3, 1884.
* Capt. H. S. Taber	..... July 3, 1884,	Dec. 19, 1893
Capt. Carl F. Palfrey	..... Dec. 19, 1893,	Aug. 16, 1894
Lieut. W. L. Sibert	..... Aug. 16, 1894,	Sept. 14, 1898
Capt. H. C. Newcomer	..... Sept. 14, 1898,	March 3, 1899
* Lieut. Robert McGregor	..... Mar. 3, 1899,	March 13, 1901
Capt. C. L. Potter	..... Mar. 13, 1901,	Apr. 27, 1901.
Capt. G. D. Fitch	..... April 27, 1901,	July 24, 1906
Capt. W. D. Connor	..... July 24, 1906,	Oct. 31, 1908.
Capt. C. R. Lukesh	..... Oct. 31, 1908,	Dec. 7, 1908.
Maj. M. L. Walker	..... Dec. 7, 1908,	Sept. 19, 1910.
Maj. C. S. Smith	..... Sept. 19, 1910,	Aug. 30, 1912.
Maj. E. M. Markham	..... Aug. 30, 1912,	Mar. 10, 1913.
* Capt. A. B. Putnam	..... Mar. 10, 1913,	June 8, 1915.
Maj. E. M. Markham	..... June 8, 1915.	
x Little Rock office established February 1, 1881, prior to which Arkansas works were under officer at St. Louis.		
* Deceased.		

DAN C. KINGHAM,
Chief of Engineers, U. S. Army."

Witness understood that the navigation of the Arkansas River at Oklahoma is better below the mouth of the Grand River than it is above, and so far as he knew, said river was not being used for said purposes above the mouth of the Grand River. Only knowledge that he had of the navigation of the Arkansas above the Grand was derived from reports, witness having in mind a report that was prepared by Captain Taber, of the Corps of Engineers, as part of his

annual report, in which he describes a certain line of steamboats and barges, or possibly, a steamboat and barges, that were especially built for navigation on that part of the river between Fort Gibson and Arkansas City in Kansas. Witness recalled somewhere in the printed annual report of the Chief of Engineers the description of such a fleet, which was not built by the Government but by private enterprise. Witness further stated that it seemed to him that there was a statement possibly a year or two later that it had not proved successful or profitable and the fleet was sold.

Impression of witness was that it was either bought or authority was requested to buy it for use in improving the Arkansas. Witness did not remember the name of the boat, but that boat was the one referred to in said communication of September 10, 1915, referring to the report of the Chief of Engineers for 1885 on page 1611—

“During the latter part of the fiscal year a steel steamer with a fleet of five steel barges has been put on the river from Arkansas City to Fort Gibson.”

Witness thought there were other records showing navigation above the mouth of the Grand River on the Arkansas, but he did not then recall them. The Arkansas is only one of many rivers and there are other items besides the one above referred to that are equally convincing to witness that the

Arkansas was a navigable river. Witness could not
626 recall such other items and the item above referred to would seem to him a conspicuous one and that item alone was enough to determine his opinion that the river was navigable. The opinion of a man who has to act as an expert in this matter may be based on a great many things. Witness sent a statutory board out to the Arkansas, and incidentally one of the members of that board, in office of witness, spoke of meeting a man who had been a navigator on that part of the river and who was a pilot on a Government snagboat over that portion of the river. Witness had heard of that before. There are a thousand and one little things like that that may enable a man to form his opinion. Witness did not remember the name of the pilot referred to, nor the name of the snagboat, and was not familiar with the character of the bed of the Arkansas River above the Grand.

Witness had made and assisted in quite elaborate studies years ago in regard to the cubic feet per second necessary to afford a channel for useful commerce on the Tennessee River, the Clinch River, the Little Tennessee, and the French Broad, and witness and his assistant endeavored to prepare

certain formula that would enable them to say whether, given certain things, they could accomplish certain other things. It depends on a good many things; it depends on the kind of navigation you are going to have. If a river extends into a heavily timbered country, you may get a very useful navigation by floating out rafts and single logs, and have commerce of great value, and if the river is smaller, you may float out cord wood, and that may be of value, and the amount of water may be comparatively small, almost measured in buckets full. If the river was broad, flat and sandy, it would not be safe to carry timber in that way. If the general transportation of the country is poor, so that it is necessary to take advantage of any kind of navigation, it will be used under circumstances

627 where it would not otherwise be used. In some cases, like the Clinch River, way up in Virginia, the people build rafts on the bare, dusty ground, apparently, and wait until a sudden freshet comes; they call them tides up there. The Clinch River has rocky slopes and is very terrenal in character. When there is a sudden rainfall, the river rises from twenty to thirty feet and would have floated a battleship if it had been up there, but it soon subsides. It lasts long enough to carry out rafts of logs and sometimes flat boats on which are loaded livestock and grain and other farm products are floated down the river. Appropriations have been made by Congress for improving the Clinch River but not more appropriations than have been made for improving the Arkansas.

Witness supposed there is no river that is broader and more divided and sub-divided by a greater number of sand bars and divers channels [that] the Platts, and way up in Nebraska, witness was amused not long ago in reading Parkman's Oregon Trail to find that when Parkman was far out on the Platte he was watching the buffalo come across, and met a large fleet of boats, manned by what they call the French "Voyageurs", men painted up like Indians, who had come down with a cargo of valuable furs from Fort Laramie, way up in the interior. They were passing down with those furs to the mouth of the Platte, and thence down the Missouri, and thence by way of the Ohio up to Canada. That was a very useful navigation at that time. They had skilled pilots and they took advantage of the river when it was high,—when it was at a good stage,—and they navigated usefully a river in which the buffalo were bogging down in the quick sands and disappearing.

Witness further said that to undertake to limit the useful navigation is a very difficult thing and inasmuch as to be a

navigable river,—to be a navigable water of the United States,—is an advantage and privilege to any stream, “the construction has always been very liberal, and we have extended the protection over them just as far as we can.”

628 Here witness was asked the following questions, to which he made the following answers:

“Q. Now assuming that above the mouth of the Grand River on the Arkansas, the channel consists of shifting sands, or that the bed consists of shifting sands, making the channel one of uncertain position, with the height of the banks varying from fourteen to twenty-two feet in a section of sixty-five miles and a width between banks in that section varying from three thousand to seven hundred and fifty feet, the average being one thousand eight hundred and seventy feet, with a fall in sixty-five miles of one hundred and thirty-four feet or an average rate of 2.06 feet per mile, how much water, measured in cubic feet per second, would be necessary, in your opinion, to furnish a channel that would be of any worth for navigation purposes in a region in which there is no commercial timber?

A. I could not say right off; I could not tell you how much it would be, but I should think it would require a pretty good discharge in such a river as that. I should be inclined to think that, and I should doubt the navigability if there was not three or four thousand feet at least per second.

Q. Would you consider such a stream as described in the preceding question susceptible of any useful navigation if the ordinary low water discharge was not more than 350 feet per second?

A. I should doubt very much if it could be navigated at low water, but I do not hold that a river is unsuceptible of useful navigation when it cannot be navigated all of the time. There are very few rivers that are navigable all of the time. Even the Hudson River, with its enormous commerce, is not navigable for three months in the year because of the ice. I myself, at the inauguration of President Grant, marched across it with the corps of cadets and a band, and the officers mounted, as if it were a bridge, at West Point, and returning a few days later marched back and re-crossed

629 the river. But that did not make the river navigable.

The Detroit River, which has the greatest commerce of any narrow body of water in the word, is absolutely closed to navigation for five months out of the year, and all its useful navigation is during seven months. The Yukon River, which I have traveled, is a glacier for more than half of the year.

In many places it absolutely has no water in it. Whatever water there was is changed into ice, and is solid down to the bottom in many places in the river so that the only possible means of transportation upon it is by sledges or sleighs but nothing like a boat can pass over it. During about five months of the year it carries very valuable commerce in great big steamboats two hundred and fifty feet long, which travel over it for fifteen hundred miles, and other smaller ones for nearly a thousand miles more.

So that the absolute continuity of navigation is not necessary to make a river navigable. If a river was susceptible of navigation any month in the year, that is, useful navigation I would say it was undoubtedly a navigable water of the United States."

Witness stated that he had no knowledge of the duration of floods in the Arkansas River in Oklahoma or as to the certainty of their date of arrival. Witness further stated that he would say that a river that has banks, visible, evident banks, as high as fourteen feet, must have floods quite frequently, otherwise the banks would crumble down and cease to be visible, as banks of a river with a sandy bottom.

Witness stated that he had improved or helped improve a great many rivers for high stage of water only and he would not say that, assuming that the floods are of such short duration and so uncertain as to date of arrival that shippers and boatmen could not depend upon them, any scheme for making the river navigable would have to be of such a character as to make navigation practicable at very low stage.

630 Witness said that he did not regard the Arkansas River as a very promising proposition to make a useful practicable route of commerce over, but he thought it was susceptible of such use and with sufficient money he would attempt to make it navigable clear up into Kansas. Witness stated that he did not mean to say that the money expended would be of due proportion to the value received. Witness was not sure that navigation would have to stop at Wichita, Kansas, but that seems to be the point above which the past Congresses have never proposed seriously to go, although they did propose seriously to go up as far as Wichita.

Witness thought that there must be a point somewhere where the supply of water finally runs out for navigation and he judged it would be pretty near that at Wichita. Witness stated that he dare said the flow at Wichita is equal to the flow at

the upper limits of the improvements on the Trinity River. There are some rivers, like the Bayou Teche in Louisiana where they pump out the water above the lock and don't have enough left for navigation. Witness did not know what the flow in the Trinity River in Texas is as measured in feet per second but somebody told him it only made the water about an inch deep, going through the lock at extreme low water.

Witness knew about the attempted improvement of the Wisconsin River below Portage. Witness thought its navigation had been attempted and abandoned, no improvement being active at present.

Witness was here asked the following question, to which he made the following answers:

"Q. Do you recall the reference to that river as having a low water discharge of about two thousand cubic feet per second, and an average river slope of about one and one-half feet per mile, as being referred to in the report of
631 the Board of Engineers who examined the Arkansas River in 1886?

A. I am not familiar with that report, but I should be very much surprised if they had made such a report as that that because with such a slope and such a discharge it ought to be possible to make the river navigable, but it might not be profitable to do so. But it ought to be possible. I might explain with regard to the navigability of rivers, that it depends a great deal upon the kind of draft that you propose to use on it. A great many rivers are now affording useful navigation that were not used for that purpose in the past because the only means we had of using them was by great big steam boats, either side-wheel or stern wheel boats that had a lot of top hamper and carried so much dead weight that they required a good deal of depth and width to navigate, but lately the navigation by the boats of light draft, the boats carrying cargo only, and also the use of the motor boat, and the use of the gas engine, the internal combustion engine enables a very much lighter motor to be used and very much less dead weight to be carried, and shallow rivers are now coming into use.

I had occasion to show a United States Senator this morning, just before I came in, which makes it fresh in my memory—how upon a river that has been regarded as practically dead they are establishing a line of light steel boats with in-

ternal combustion engines, that turn out very successfully, and they are even now—although they have only one boat in operation—able to make through freight rates at very material reduction. I had a list of their freight rates.

Q. What river is that?

A. That was the river from Macon, Georgia—the Okmulgee and the Altamaha River, the two combined making a route through to Brunswick, and thence by inside water route to Savannah."

The lightest draft of the new character of boat was two feet, with which draft useful commerce is expected. Development has been very interesting along those lines.

632 Witness had never made an extended examination of the reports and records of the War Department to ascertain what the holding of the War Department has been as to the navigability of the Arkansas River above the mouth of the Grand River. It was conclusive to the mind of the witness that the river was navigable and there seemed to be no more reason to do it than to consider the navigability of the Potomac River. Witness had never made any investigation to decide whether or not the Potomac was navigable.

It was more the thought of the witness that the words "navigable portion" occurring on page 896 of the printed report in pamphlet form of the witness, as Chief of Engineers, for the year 1914, reading: "The general project for the improvement covers the navigable portion extending from the mouth of the river to the mouth of Neosho (Grand) River, 461 miles",—meant the navigated portion.

The witness further stated with regard to said language used in said report:

"Of course, I may explain now that that is really not my own language. I have not written all of these things myself; they are prepared by my subordinates and submitted to me, and so far as I can, I read them over, but I do not really read them all over, and very many things that go out in my name I have not even read at all. But there is always this thought of difference in a person's mind as to navigable; one is the part that is being used or is being improved, or being treated for the benefit of navigation, the other is the part that is susceptible of navigation but which is not under treatment, and which we are not authorized to treat. For example, very often we have a project that we propose to improve—we will say the Hudson River up as far as Troy. We speak of it

then as the navigable portion of the Hudson River. Now we do not mean to say that we have considered it judicially and excluded all the rest of the river and declared that that
 633 is not navigable water of the United States, or is not susceptible of navigation, but it is not the part that we are improving under that project. There are a great many things that come up about rivers that have nothing to do with navigation, but have to do in a way with navigability. It is not lawful to construct, or to commence the construction of any bridge across navigable water of the United States except under authority of Congress, and therefore if we take up a river and somebody comes forward and starts to build a bridge there, or asks to build a bridge, we would call on him for his authority to do it. We would not then go into an exact consideration as to whether that portion of the river that was to be spanned by that bridge was susceptible at that time of useful navigation. We would not go into the fact of whether it was susceptible of a paying navigation, but if there was a prima facie case that this river was, or had been at any time, or was likely to become a useful, navigable water, we would go ahead and consider the plan."

Witness would not allow any river to be obstructed which might, under any possibility, become or be considered navigable.

Witness was not familiar with the statement contained in the report of the Chief of Engineers for 1903 and each year thereafter up to the present time that "Fort Gibson, on the Grand River, two miles above its mouth and 463 miles from the mouth of the Arkansas River, in the head of navigation." The opinion of the witness was that the office in writing the report, and very probably it had been carried along from the man who wrote it the first time, had in view useful commercial navigation, the kind of navigation that the Government was bound to foster, and might properly expend money to improve.

Witness had not seen in the report made by Colonel Long of the Topographical Engineers, dated December 20, 1853, contained in Senate Executive Document No. 26, the following statement:

"The Arkansas River is navigable only to the junction of the three forks, distinguished by the names of the Arkansas, Verdigris and Neosho."

634 Witness did not know that on page 30 of the work compiled by Captain A. A. Humphries and Lieutenant

H. A. Abbott, Corps of Topographical Engineers published by authority of the War Department, it is stated that Fort Gibson is situated at the head of navigation on the Arkansas River.

Witness here further stated:

"I think very likely they did state it, but I do not know it. I would like to say in regard to that that such such reading as I have done of these older reports leads me to the conclusion that in the early days the United States went very timidly at this question of the control of navigable waters, and that they did not take the broad view that they have gradually taken, apparently, I think from the court decisions, but anyway for reasons of their own, so that they extend much further over the navigable waters than they did. They required rather the navigability, the question of navigation to come forward and prove itself, or else they did not accept it. Nowadays, I think they are more disposed, probably by reason of the court decisions, to extend the question of navigability much further, and if anybody says that a river is not navigable water of the United States throughout its entire length, if it is navigable anywhere, that they must come forward and show affirmatively why and how it is not navigable water of the United States. It seems so to me, at least. So I have always looked in the early decision for a much more restricted view in regard to this question than in regard to the later ones."

Witness did not know the statement in the report of Engineer F. S. Burrows, made in 1834, contained in House Executive Document No. 90, 49 Congress, 1st Session, reading as follows:

"In the discussion of the river with reference to its general hydrographical features,—that is, depth, oscillation, character of bed and banks, obstructions, both natural and artificial, the general feasibility, desirability and probable cost of making successful navigation possible throughout the whole, or part of the river embraced in this survey it should be borne in mind that no portion of it is at present or
635 has ever been considered navigable. The mouth of Grand River is now considered the head of navigation, although, in fact, the commerce of the river for forty miles below this point is practically nil."

But the statement seemed familiar to him and probably he had read it.

Witness could not say without refreshing his memory that he had ever read the statement contained in the report made by the board of five engineers who examined the Arkansas River, contained in House Executive Document No. 234, 50th Cong., 1st Session, referring to the section of the Arkansas from Wichita, Kansas, to the Canadian, which is 41 miles below the Grand—"The commerce over this section of the river is, and always has been, practically nothing",—but witness said it seemed to him that he had read the statement.

Witness was here asked the following questions, to which he made the following answers:

"Q. Do you remember or do you know about an examination which was made by a board of three engineers in 1899, appointed by the President, under rivers and harbors act of March 3, 1899, contained in House Document No. 150, Fifty-sixth Congress, Second Session?

A. I do not recollect it by that description. In the first place I should not expect a board of engineers to be appointed by the President, but that is immaterial, but that makes it so I do not identify it readily.

Q. The act provided that "the President is authorized to appoint a board of three from the Corps of Engineers, whose duty it shall be to thoroughly examine the Arkansas River and report as soon as practicable to the Secretary of War", and so forth, and under that provision the board was appointed, consisting of Lieutenant Colonel Amos Stickney, Captain Charles L. Potter and Captain Robert MacGregor, and their report is contained in the document before described. Do you remember that document—do you remember reading it?

636 A. I do not remember it now. I might remember, if

I knew, some of the contents of it, but I do not seem to remember it. You see you have taken me at a little disadvantage; you have not told me beforehand what you were going to ask me about and I have not refreshed my memory at all about these things. The records of the Engineers' office compose rooms and rooms full of documents, and the number of reports of this kind that we have come in are enormous in the aggregate, and the Arkansas River is not particularly an interesting river and not a very important work and, except where it has been brought up and brought to my attention in connection with this very matter I have had no occasion to think very much about it. If those things are certified among the things that we furnished, why the certificate is there and gives them all the authenticity that we can give them.

Q. In the document before referred to is the statement that: "Ft. Gibson on the Grand River 2 miles above its mouth and 463 miles from the mouth of the Arkansas River, has always been considered the head of river navigation."

A. Congress evidently did not consider it so and Congress has a very good right to judge on those matters. I think, as I have said before, that these boards which are appointed with reference to the improvement of rivers have in mind all the time the point up to which it pays to improve it, you know, not up to the point at which it is technically susceptible of navigation, so they are apt to speak of the head of useful navigation, the head of navigation that it would pay to improve as if that were the upper limit of the whole thing.

Q. Again, in the same report, the board says: "As before stated, the mouth of the Grand River has always been considered the head of navigation on the Arkansas River. Attempts at navigation on the river above that point have been of rare occurrence and soon abandoned."

637 The river between Wichita and the Grand is crossed by nineteen fixed bridges and by two fixed dams." Have you any knowledge of those things?

A. I have not any knowledge of them. You mean of the statements before made?

Q. Yes, as quoted to you; as contained in the document referred to.

A. No; I have not any knowledge except that they are statements in there, apparently. I do not know whether they are true or not.

Q. Do they have any influence upon your opinion with regard to the navigability of the river in that section?

A. The only thing there to indicate to my mind that the river is navigable is because they say attempts to navigate it have not been very successful. The fact that somebody attempts to do a thing indicates that he believes it to be possible, and if several people have believed that, it would incline me to the opinion that it is what we call navigable water, not that it was the kind of water that would pay to navigate, not the kind that we would be justified, perhaps, in taking the people's money to improve, but that it would be the kind that we would have the right and have the duty to afford such protection as it needed. The stream that can float the birch canoe of the Indian, if he carries his freight and goods on it, is entitled to have that protection that will enable him to float his canoe, and of course nobody should be allowed to put in a bridge that would stop his canoe. They may have very properly put in a bridge that would stop a battleship or a very big steamer, because there are none that can

638 go there, but if it is susceptible of floating a raft, there ought to be means to permit the rafts to go, and nobody should be permitted to put in a dam that would interrupt navigation. I do not mean to say that nobody does put in dams that interrupt navigation, because a number of navigable rivers have got them. It is on the same principle that nobody has a right to commit a crime or misdemeanor, but that does not prevent them from doing it."

Witness did not have any knowledge of and did not recall any rafting or floating of logs having occurred on the Arkansas above the mouth of the Grand. He had not exhausted the official reports.

Witness remembered the conclusion reached by Major M. L. Walker, in his report in 1909, under act of March 3, 1909 and under direction of the Chief of Engineers, contained in House Document No. 206, 61st Congress, 2nd Session, that in his opinion the Arkansas River between Tulsa and the mouth of the Grand River was not worthy of improvement, in said report of Major Walker appearing the following:

(a) "The steep slope, the small low-water flow, and the shifting sands and gravel in the bed of the river preclude any possibility of improving it by means of regulation works so as to afford a channel that would be of any worth for navigation purposes".

(b) "The mouth of the Grand has always been considered as the head of navigation on the Arkansas River, and if there has ever been any commercial navigation of any sort above that point this office (referring to the Little Rock office) has no information of it."

Assuming that the statements in report of Major Walker were true, witness stated that did not change his attitude.

Witness here further said:

639 "What I was about to say was that it would tend to convince me that it was not worth trying to go on with the improvement up there that Congress had directed us to do, and that I should have been disposed, if I had been Chief of Engineers at that time, on the strength of that report, unless otherwise advised by my subordinates that it passed through, to recommend that it be stopped. But that would not change my opinion at all as regards whether this was navigable water of the United States or not. I think we have recently examined over 200 different projects now under improvement, and many of them we have advised Congress to

stop the improvement, not to go on with them any further, not because the river we were working on was not navigable, but because there had not developed enough commerce to warrant the expenditure of the money."

Work on the whole of the Arkansas River clear down to its mouth was recommended to be suspended, under the last rivers and harbors act. The Arkansas was examined, but not to see whether it was navigable or not, because the boats of the Government had been going over it for years and years.

In response to the question what was his idea as to what, under the law, constitutes navigability of a stream, the witness said:

"That, in its natural condition, it is susceptible of use in the interests of navigation and commerce. That it can assist, can facilitate the transportation of anything that the people have to transport; and even it might go further than that, that if the very water that it transports adds itself down below, that that is a useful transportation, because we can easily see that if we could not bring the water down into the lower part of the river, the lower part of the river would be no
640 better than the upper part, and therefore really I am of the opinion that the transportation of water is a useful commercial thing and that it is proper that the United States should exercise such supervision and jurisdiction over all of those streams that bring water to the main stream as to see that they are not diverted, not taken away."

Witness then stated that he considered the upper part of a stream which cannot be navigated as a part of a navigable stream because the lower part of it is navigable and navigated.

Witness considered that the entire stream is navigable where the waters of the upper stream are necessary to give water to the lower portion, although the upper portion is not navigable.

Witness considered the Arkansas River a navigable water of the United States up to Wichita, Kansas. Witness did not know whether he considered the Cimarron River a navigable waterway of the United States or not, but assuming that the Cimarron River is the most important tributary of the Arkansas above the mouth of the Grand and that it flows very large quantity at high stages and has a width between banks where it flows into the Arkansas of three-fourths the width of the Arkansas itself, and furnishes a very considerable

amount of water flow to the Arkansas where it enters about 85 miles above the mouth of the Grand, he would say that it was a navigable waterway of the United States.

Witness further stated that in forming his opinion as to the navigability of the Arkansas above the Grand he considered the theory that a stream which may be made navigable by artificial means, although not in fact navigable without the aid of artificial means, is a navigable waterway of the United States. Such theory would have certain weight, but would not be conclusive. Witness would be very acutious about depriving a river of the protection which being a navigable water of the United States gives it, witness believing that abundant caution should be exercised by him.

641

Redirect Examination.

The Department, in determining the question as to whether or not a stream shall be regarded as navigable, takes into consideration the possibility for improving the river as well as the actual condition of the river itself. For example, a river may be obstructed by snags and things that may be very easily removed.

Witness thought that the Susquehanna River was navigable in Pennsylvania and also navigable in Maryland, but that there was a non-navigable stretch between the two.

The Ohio River has falls at Louisville, which cannot be seen at high water but at low stages are practically impassable until locks,—a lateral canal,—were put around there.

A system of locks and dams were put in the Trinity River in Texas, which were considered necessary in order to make that river available for navigation of considerable importance during periods of low water.

The expression "head of navigation" as often used does not mean necessarily the head of the navigable part of the river. It has come to mean with the Department the head of navigation expected to be used, developed or improved. There is almost always a stretch of river above that which is not expected at present to be developed. Witness thought that navigability is rather an unhappy term in view of its ambiguity. A little ways back the United States did not exercise any control as to the construction of bridges across such rivers as the Ohio. Many navigable rivers were spanned with bridges, many rivers wherein dams were built under the authority of the legislatures of the States or perhaps without any authority at all, but of recent years and under recent legislation Congress has awak-

ened from its sleep and has asserted the right, which of course it always held.

642 Witness was then asked the following question:

"To sum the matter up, your conclusion is that should the demands of commerce of the territory adjacent thereto ever require it, the Arkansas River to Wichita, Kansas, can be made navigable for the purposes of practical navigation?"

To which question, the witness answered: "That is my opinion."

Recross Examination.

The Ohio is a much better river than the Arkansas. Witness thought there was not so much difference between the lower Ohio and the Arkansas, but the bottom of the upper Ohio is much harder, more rock.

Witness did not remember definitely what length of time the appropriations for the improvement of the Arkansas extended and when they stopped. He did know that the appropriations for improvement of the river higher up than the mouth of the Grand stopped some years ago. Witness did not know that for a number of years the appropriation for the Arkansas River was confined to the State of Arkansas, but he thought that expenditures were made down there perhaps exclusively. Witness did not remember the phraseology of the acts, but he thought they went on under about the same project for a number of years, even though they ceased to mention anything about Wichita, they still continued to say, "for the improvement of the Arkansas; continuing the improvement." Witness thought that was about the language of the law for a number of years.

643 Here the court's attention was called to Act of Congress approved February 17, 1897, 29 Stat. 531, also to the Act which took effect January 29, 1897, 29 Stat. 502; also to Act approved May 14, 1898, 30 Stat. 407, and Act of February 17, 1897, 29 Stat. 531.

Defendants offered in evidence part of pages 1566 and 1567 of the annual report of the Chief of Engineers for 1905, as their Exhibit "D".

Defendants here offered in evidence from Congressional Record of December 17, 1915, on pages 421 and 422, as Exhibit "E", the following:

(Plaintiff's Exhibit E.)

"Bridge across the Arkansas River, Tulsa, Okla.

Mr. Davenport. Mr. Speaker, I ask unanimous consent to take from the Speaker's table the bill H. R. 3681, which has been reported favorably from the Committee on Interstate and Foreign Commerce and also favorably from the War Department. It relates to the construction of a bridge across the Arkansas River, by Tulsa County, at or near Tulsa, Okla.

The Speaker. The gentleman from Oklahoma asks unanimous consent for the present consideration of the bill, which the Clerk will report.

The Clerk read as follows:

A bill (H. R. 3681) authorizing the construction of a bridge across the Arkansas River, at or near Tulsa, Okla.

Be it enacted, etc., That the County of Tulsa, in the State of Oklahoma, be, and is hereby, authorized to construct, maintain, and operate a bridge across the Arkansas River at a point suitable to the interest of navigation, at or near Tulsa, Okla., in accordance with the provisions of the act entitled 'An Act to regulate the construction of bridges over navigable waters,' approved March 23, 1906.

Sec. 2. That the right to alter, amend, or repeal this act is hereby expressly reserved.

The Speaker. Is there objection?

Mr. Cooper of Wisconsin. Mr. Speaker—

The Speaker. For what purpose does the gentleman from Wisconsin rise?

Mr. Cooper of Wisconsin. Reserving the right to object, I would like to ask a question. What is the urgent necessity for passing this bill at this time, without having it referred and—

Mr. Davenport. It has been referred and reported favorably by the War Department and reported favorably from the committee this morning.

Mr. Cooper of Wisconsin. I did not mean without having it referred but without having it printed.

Mr. Davenport. I can answer the gentleman's question. The county thought, as the railroad company and the toll-bridge company had been permitted to construct bridges there without any authorization, that they could go ahead and do the same thing.

When the county did that the War Department called attention to the fact that it had been declared a navigable stream up to where the county wished to construct a bridge. In the meantime, they have several thousand dollars' worth of material on the ground, and they cannot go ahead
644 without getting this authority. For that reason it seems important to them to go ahead at this time.

Mr. Cooper of Wisconsin. I shall not object. I wish to say, however, that it will not be long before objection will be made to the granting of unanimous consent for the construction of bridges across navigable streams unless the title of the bills are printed in regular order on the Unanimous Consent Calendar, so that the House and the county, and especially the people of the localities where it is proposed to erect these structures, may be thus duly notified that such legislation is pending.

The Speaker. Is there objection to the consideration of the bill?

(After a pause) The Chair hears none.

The bill was ordered to be engrossed and read a third time, was read the third time, and passed.

On motion of Mr. Adamson, a motion to reconsider the vote by which the bill was passed was laid on the table."

A copy of the map introduced during the testimony of the witness Irving Perrine by defendants, to-wit, defendants' Exhibit B, is attached at the end of this statement of facts and form a part of same.

645 Defendants here introduce testimony of THOMAS BAIRD in the Nolegs case:

Direct Examination

Witness states that he is a retired farmer and [sic] thirty-three years old; that he has lived in Arkansas City for forty-one years, thirty years of which time he spent on a farm four miles west of the city. When he lived on the farm witness states that he was about three miles from the river, but the

city is about a mile or a mile and a half from the river. He states that he was acquainted with the circumstances of the boat "Aunt Sally", being at Arkansas City about thirty or forty years ago. As he recollects, the boat was there in 1878 and was a good sized boat, one that would accommodate about two or three hundred people crowded. Witness states that this boat laid around the city about a month and made excursion trips up and down the river. He states that the boat came up the river from the State of Arkansas but he does not recollect whether from Fort Smith or Little Rock. He also states that he was on the boat and celebrated the Fourth of July, 1878, on the boat, riding up and down the river. At the time he was in the Arkansas City band and made several trips on the boat with the band. Witness produces a picture of the boat, marked "Exhibit A" which he supposed he got from a man named "Bonsell", a photographer at Arkansas City. This picture, he states, was taken on the Fourth of July, 1878, and is a true representation of the boat. (The picture is exhibited to the court but not left with the stenographer to be incorporated in this record.) Witness states that when the "Aunt Sally" came up the river in those days it was considered a big boat, but that it is a small boat. After that he states, there were several boats built at that point in the river, but he does not recollect their names. These boats were built from '78 to '85 before they got the railroad, as they had no ways of getting their produce to market, and the object of building these boats was to ship stuff down the Arkansas. One of the first of these boats was the "Arkansas Millers",
 646 built by the Millers; another, he thinks, was the "Cherokee". He does not recall who built the "Cherokee" but a man named John McCluskey was the engineer. These boats, witness states, were said to operate south to Arkansas from Arkansas City. Witness states that he used the Arkansas river to bring lumber down from Wichita—fifty miles above Arkansas City. He states that he was a contractor and had two churches and several dwellings to build and the lumber used in their construction they made a raft of and rafted it down from Wichita on high water. This, he states, was in May of 1877. Witness states that during this trip from Wichita he also rafted the steel for a bridge on the Walnut. He states that he did not use the river below Arkansas City for commercial purposes, nor did he accompany the boats which he states left Arkansas City and went south. He states as to the horse power of these boats the "Aunt Sally" had good power but his impression is the other boats built around Arkansas City used threshing machine engines.

Cross-Examination

By Judge Dillard:

Witness states that he resides at Kansas City and that the last boat he referred to was on the river some time in the '80s, after the railroad came down from Wichita they had no further need to navigate anything. He states that at the time the "Aunt Sally" [remainder] at Arkansas City for a month it came from Little Rock or Fort Smith. The "Aunt Sally" came up the last days of June and as he recalls remained through July, 1878.

Q. I ask you, Mr. Baird, if this description from the report of the Government Engineer who surveyed that river does not, according to your recollection, cover this boat, the "Aunt Sally":

"It is true that on one occasion a small boat made the trip from Little Rock to Arkansas City, Kansas, and returned, but it was of no particular benefit as demonstrating the navigability of the stream. The boat was of a very light draught
647 made the return on the crest of one of the short rises in June and July and carried no freight of consequence either way."

Will you say to the best of your recollection that that covers the Aunt Sally?"

A. I would think it was, as near as I could remember.

Q. Now, do you know what finally became of the "Aunt Sally"?

A. It went down the river with the intention of coming back again but I have never seen it back since, making regular trips, that was what they thought while they were up there.

Witness states the "Cherokee" was built for taking flour down the river, but he does not know the size of the boat; he does know, however, that the trips were usually made at a medium stage of the water as they would not think of starting out on low water, and of course they would use good judgment about what time to go. While these boats did not draw much water he states that it is his opinion that they would not go down, or start down, at low water, nor does he believe that they would think of starting down at the stage which the river is at present. Witness states that some times he has crossed the river with his boots on and did not get his feet wet, and other times he has had to swim. Striking an average between these two extremes would be the time he judged these boats would start down the river. He is not willing to state under oath, however that these boats plied the river at or-

dinary low water mark. He states that the present condition of the Arkansas river from Arkansas City down is very low and that there are a good many more sand-bars now than there used to be, and the bed of the river is very broad and sandy. The river is also filled with sand-bars, at least from Arkansas City down to the limits of Pawnee County. Witness states that he has never attempted to run a boat, or skiff, on the Arkansas River but that he thinks you could run a skiff at this time of the year down the river very nicely between the east line of Pawnee County and Arkansas City. He states that he bases this opinion from what he saw this morning when he crossed the river, and that there is a little rise in the river this past week.

648

Cross-Examination

My Mr. Biddison:

Witness states that it has not been at any time the habit of the people of Arkansas City to take merchandise to Wichita or bring merchandise down from Wichita to Arkansas City by means of the Arkansas river, and that his trip was the only one that he knows of. Necessity being the mother of invention, he had to resort to a raft as a means of transportation of the bulk of stuff he had to bring from Wichita. This raft, witness states, drew from twelve to fifteen inches, and the trip was made along the last days of May, 1879, when the water was at its highest. Witness states that at the time he "Aunt Sally" was at Arkansas City in the early days of July, 1878, she was just simply an excursion boat making trips on a little stretch of the river and when the boat left there they took stuff down with them but never made but the one trip. Witness states that he does not know of any of the other boats that went down and came back. Referring to the ordinary stage of the river, [that is,] that is, when it is affected by sudden or temporary rains or floods from the mountains, etc. witness states that he thinks some of the boats did go down the Arkansas river at ordinary stage but it is his opinion that there was more water in the early days than there is now in the Arkansas. He also states that there has been a noticeable decrease in the navigability of the river since the settlement of Kansas west of Arkansas City for the reason that the country is settled now and the water goes into the ground that is being cultivated and does not run off like it did. Witness states that since the opening of the Cherokee Strip at Arkansas City or below, the river has not been put to any practical use for the purposes of trade and commerce.

Cross-Examination

By Mr. Lyons:

Witness states that in his judgment it would be very hard to navigate the Arkansas river during the last twenty years except at high water. Perhaps it might be done down
649 the main channel in small flat boats, but that would be the only practical navigation except at high water.

Cross-Examination

By Mr. Taylor:

Witness states that in the '70s there was more water in the river than there has been in recent years. Compared to previous years, the water during the past year has been practically dired up at times though in the last few years there has been extremely high water. The character of the Arkansas river as observed by him, witness states, has been shifting as to sand-bars and things of that character. He states that after low water and during the prolonged dry periods where the river is bare, cottonwood trees start up on the bed of the river causing river bed to shift. He states that they are farming where the main river was up "there" with him.

Redirect Examination

By Mr. Ledbetter:

Witness states that the boats such as he has described would go down and be operated on the river at a time when the water was in an average condition, between the two extremes described by him awhile ago—between the time he crossed the river with his boots on and did not get his feet wet and the time he had to swim across—between these two extremes boats would operate without trouble. He also states that during some seasons this average condition continues much longer than at other seasons.

Recross Examination

By Judge Dillard:

This average condition of the river, witness states, would be at a time when there would be a rise or swell in the river from its ordinary stage. In answer to a question by Mr. Taylor, witness states that he is not interested in any way in this litigation.

Defendants here introduced testimony of C. M. SWARTZ in the Nolegs case:

650 Witness states that he is fifty-seven years old, and is, and has been, in the dry goods business for thirty odd years. He has lived in Arkansas City and near by within a

mile for over forty years. Witness states that he is acquainted with the Arkansas river at Arkansas City and is acquainted with the circumstances connected with the visit to Arkansas City if the boat named "Aunt Sally". At the time he was present and saw the boat, and referring to the photograph of the boat marked Exhibit "A" he states that that is a correct representation of the "Sally". He states that other boats that he remembers being at Arkansas City are the "Kansas Millers", the "Cherokee" and several others, the names of which he does not recall. The "Aunt Sally", he states, came from Little Rock. The "Cherokee" was built at Arkansas City, and the "Kansas Millers" partially built at the same place and partly a few miles north. He states that the boat "Aunt Sally" was around Arkansas City for several weeks and that he would say [he] size was 20 x 160 feet. Witness states that the "Cherokee" was probably larger than the "Aunt Sally" and after it left Arkansas City it went down the Arkansas. The "Kasas Millers" went down also from Arkansas and witness thinks that these boats were loaded for southern ports, their cargo consisting of wheat and flour, generally. The other boats referred to by the witness, other then the two mentioned above, he does not think had any particular name but they carried merchandise down the river. At the time, he states, there was no railroad at Arkansas City, and these boats were used to convey the merchandise to market. A long time afterwards the railroad was built at Arkansas City and they abandoned the use of the river for merchandise, railroad conveyance being cheaper. Witness states that the bed of the river has always been full of sand, and he does not know that there has been any change in its condition, nor has he observed whether the cultivation of soil along the river in recent years since it has been settled up has had any effect on the accumulation of sand in
651 its bed. He states that at the present time small gasoline launches are used at Kansas City for pleasure, running a few miles up and down streams. Back in the '70s to '80, before railroads were built, witness states that there was plenty of water at seasons for almost any sort of boat, and boats could go up and down the river at the half stage of the high water. These seasons of high water witness states would last about four or five months of the year in the Spring time and there was a difference in length of time in various seasons that the river could be navigated.

Cross Examination

By Judge Dillard:

Witness states that the "Aunt Sally" went down the river when it left Arkansas City but cannot say whether it ever returned as he never heard of its return, nor has he ever heard of the "Cherokee" returning after it went down the river. Witness states that he does not know whether the attempts to navigate the Arkansas river for commercial purposes proved a failure after the first effort, the "Kansas Millers" and the "Cherokee" being an experiment. Witness states that his testimony in reference to the condition of the Arkansas river as to the water and its capacity to float boats is based on the condition of the river at Arkansas City and not within the limits of Pawnee County. Witness states that the average stage of the river referred to by him would be either a fall from the ordinary high water mark or a rise from the ordinary low water mark. Taking the ordinary stage of the river when it is not affected by any rise from rains, or melted snow, witness states that the probabilities are neither one of the boats referred to could have been floated on the river during the winter months as there was not much water; he could not state that as a fact, however, during the summer months. He states that the character of the bed of the Arkansas river is very sandy and the water spreads out over a great expanse, very shallow across, making it a very circuitous river; that is, it meanders a great deal among the sand banks.

652

Cross Examination

By Mr. Biddison:

Witness states that he lived in the immediate vicinity of the Arkansas river for about forty years and during that time the only boats that he has known to navigate the river for the purpose of trade and commerce were the four that have been mentioned. As to whether any of these trips was regarded as a successful navigation of the river for that purpose, witness states he is not posted.

Defendants here introduced testimony of JOHN W. ORTNER, in the Nolegs case:

Direct Examination

Witness states that he has lived in Cleveland ever since the opening of the strip in 1893, or about that time. His present occupation is pumping water in the oil field. This water, he states, is pumped from the Arkansas river. Wit-

ness states that he is familiar with the island in controversy in this suit and has been since 1896 or 7. During those years he was in the mill business, also in the stock business, at Cleveland, marketing his products mostly at Tulsa. Part of the time, he states, these products were hauled down by him with a team, and he built a little boat and hauled some of it by boat. This boat, witness states, was 9 x 42 feet, and would carry about sixty or seventy hogs, weighing two hundred pounds each. He also shipped walnut gun stocks but no product from the mill. When the river was high, witness states he has made the trip from Cleveland to Tulsa in half a day, and at other times he has had a lot of bad luck and taken a day or or day and a half. The distance between these two places, witness states, is from fifty to sixty-five miles, and he operated his boat from about May until the latter part of July. He states that he used this boat for about two years on the river, making from three or six trips a season. Returning from Tulsa, witness states that he would bring merchandise to the merchants at Cleveland. He states that the engine on his boat was six horse power. Witness state
653 that he did not attempt to use the boat during the winter, it being dependent on the rain and the water as to whether it could be used then. Witness states that in the operation of his boat he went on both sides of the island but he operated mostly on the north or Osage side, the reason for that being that there was deeper water on the north side. If the river was up it was a straighter shot to go on the south side, and there was less brush. He states that while the channel on the north side is deeper, he does not know that it is any narrower, there being very little difference in the width. Witness states that the channel on the south side of the island looks to be just the same as any other part of the river along the entire width of the island. He states that it has been several months since he has been to the island, and that there was no vegetation on the sand in the channel on the south side of the island. He states that he knows where Mr. Thomas' land is and that there is a road that runs down the bank on the south side of the river in that neighborhood from which the channel of the river opposite Mr. Thomas' land is visible in parts. He states there is brush and timber along the road and it goes farther away from the river. He states that at the north end of the Thomas farm on the right you can see the channel of the river between the island and the road but at the south part of the farm the channel can be seen plainest. At this point, witness states that the channel would be one hundred yards wide though he never measured

it, and the channel is about the same width along the entire face of Mr. Thomas' land. The condition of this channel as compared with the channel of the river north and south of the island as to the character of soil, witness states, it is sandy, the same as the balance of the river with vegetation in it. He states that he has been in the locality of the island during low water, also at high water, and he judges that a two to four foot rise would have to occur when the water was at

654 low water mark in order for it to run entirely around the island on the south side. Witness states that he is familiar with the banks of the island on the north and east side and the water is in the channel there at all seasons of the year, ever since he has known anything about it. He states that the water remains on the south side of the island more during some seasons than others, dependent upon rains and the general condition of the river. He would say about six months in the year. Witness states that the bank of the river on the south side of the island he would judge to be from five to eight feet, and that it is abrupt. The soil, he states, is sandy like all the bottom soil along there. Witness states that there are trees on the island and on both banks of the river; the principal growth being cottonwood, and the trees on the island are the same character as on the banks of the river north and south. Witness states that the character of the soil in the channel of the river is different from that on the banks. The river bed is sand, and the soil on the bank has vegetation upon it. He states that the south channel of the river has no vegetation on it from the bank to the island. He states that he has been familiar with the condition of the channel ever since Mr. Thomas lived on his farm, and that he has never seen any farm products cultivated in the channel of the river and he has been in a position to see it if it had been done.

Cross-Examination

By Judge Dillard:

Witness states that he does not mean that the channel on the south side of the river is always full of water like the one on the north side of the island. He states that he has never noticed sandy places, just the sand in the channel, on Mr. Thomas' land or on other and up and down the river where the river runs out into the farms during high water, nor has he noticed that any such places with vegetation. He states while he has not been all over these farms he has passed up and down the road. He states that the road

runs partly along the channel and where the road runs
 655 the sand is deep like it is in the channel. Witness
 states that while there is sandy soil along the bank of
 the river there is vegetation on it, and that does not occur in
 the bed of the south channel. Witness states that according to
 his idea it would take between two and four feet of water
 above the ordinary stage of the river to throw the water
 around in the channel south of the island and at the stage the
 river is at present there are little pools of water standing
 at times, but it does not run. Witness states that while the
 bank on the south side of the island is lower at places than
 others, there is some bank all along. As to how low it gets
 he does not know. Witness again states that about 1897 or
 '98 he ran the boat from Cleveland to Tulsa between May
 and August, and that is the time of the year when there is
 generally a rise in the Arkansas river caused by the melt-
 ing snows in Colorado, and in the mountains north and west.
 He states that he took advantage of the second rise in the
 river to make the trip down the river and back. At the time
 he ran his boat around the south channel, witness states there
 was anywhere from five to eight feet rise in the river, and
 that his boat drew from twelve to fourteen inches. Wit-
 ness states that at ordinary stage at the Arkansas river he
 could not have made the trip to Tulsa and back. He states that
 sometime, dependent upon the rains, the water flows over the
 sand-bars on the south of the island between the island and
 Thomas' land for six months in the year. Witness states that
 he does not think there is any year when the water does not
 flow around the channel more than a month during the year,
 and that six months is his guess as to the time that the water
 flows around the south channel during the year, but he has
 never timed it. At times, he states, the water flows over the
 Thomas and Edminston land so that he could run his boat
 over it. This occurs when the south channel is filled beyond
 the south bank of the river. From the looks of things, wit-
 ness states you could run a pretty good boat up in it.

656

Cross-Examination

By Mr. Biddison:

Witness states that he carried three or four loads of hogs
 during a season down the river, the number of hogs carried
 being between sixty and seventy; that his hogs were loaded
 at Cleveland and it would take him two days or more to make
 the trip back from Tulsa. Witness states that this return
 trip, as well as the downtrip, would depend upon there being
 a rise in the river. He states at one time he had a break down

and it took him almost two weeks to return on account of having to get more machinery. Witness states that altogether he made some six or eight trips during the year and that he carried on these trips hogs, gun stocks and wheat. Witness states that his enterprise was not a profitable one and after running the boat for two seasons he sold it to a man who wanted it worse than he did. Witness states that he did not lose any money on the enterprise but did not consider it a paying proposition after spending a good deal of money. He states that he does not know of any one else trying to navigate the Arkansas river in that neighborhood. Witness states that the island on the south and west [side] varies as to height in some places. According to his recollection it runs up in a sand dune, and some places there is a direct elevation. On the south and west side of the channel next to the Thomas and Edminston farms there is a direct bank most of the places, according to his recollection. The road running along this bank, witness states, runs at different heights, from five to eight feet, and perhaps higher in some places. On the bank below the road, witness states, there is no vegetation, as it is just sand, and it takes a rise in the river for the water to flow through "there".

Cross-Examination

By Mr. Lyons:

657 Witness states that according to his idea he would say that the Arkansas river is not a navigable stream from Tulsa to Pawnee County, unless there would be considerable work done on it.

Cross-Examination

By Mr. Taylor:

Witness states that the swifter channel since he has known the river has been on the north side of the island. He states that his belief is that the entire river is filled up as well as the south channel but that he does not know that the south channel has filled any more than when he first saw it. Witness states that the river channel on the south side of the island is as well defined as any channel of any river and that it is absolutely clear and distinct from the banks of the island to the banks of the land. He states that the bed of the stream is pure sand and that most of the soil on Mr. Thomas' farm is a black sandy loam like most of the land up and down the river, altogether different in character from the bed of the stream at that point. He states that at a number of points between the road and the south channel along the road by the Thomas farm there are trees and shrubs. The road, he states, is sandy, a great deal of which he presumed is caused

by temporary overflow. The ordinary soil is there, which indicates that the sand has been deposited on top. The length of time that the river flows in the south channel depends, as witness states, a good deal, on the rain, some years more than others, possibly more than six months, and not much less than three months. According to his observation, witness states that he has never seen any vegetation growing in the south channel of the river.

Here the court asked witness the following questions to which he made the following answers:

Q. You stated you went around on the south side of the island on one of your trips down the river. What is the difference in distance on the north side and south side of the channel?

A. I don't know as there is very much difference in the distance, but it is a little further around on the north side, there is a straighter shoot, the maps show that, a
658 straighter shoot on the south side when the water is up, and if there is loose snags there is a lot of drift on the north side, and a difficult place to get in, and might get his boat over against the bank.

Q. You think there is not much difference in the distance?

A. Not much. I think it is a little bit nearer on the south side, my idea about it, it is a little bit nearer straighter course.

Q. Do you know how much nearer?

A. I couldn't say how much."

Redirect Examination

By Mr. Ledbetter:

Witness states that he waited for the river to rise in order to make the trips down the river. He states there were [period] of the year during which the river was higher than at other seasons and it was during those seasons that he used the river for navigation purposes. Witness states that the high water seasons of the year occur regularly.

Recross Examination

By Mr. Taylor:

Witness states that he had not observed the cultivation of the island, but he thinks it has been cultivated though he is not positive.

Recross Examination

By Mr. Biddison:

Witness states that he has been up and down the bank north and east of the island a good deal and that the bank on the north side is higher than on the south side.

Defendants here offer testimony of AUSTIN RANDLE in the Nolegs case:

Direct Examination

Witness states that he has lived at Cleveland since 1893, and before he lived at Stillwater, Payne County. He states that he is in the cement business, and that he is sixty-one years of age. Before going to Cleveland he was in the shingle and saw-mill business. Witness states that he is acquainted with the condition of the Arkansas river around Cleveland, also with the island in controversy in this case though he is not as much acquainted with the island

659 alone as with the whole body of the river. He states that his experience with the river consists in seining, fishing, rafting logs, running a ferry-boat, and other boats. He ran the ferry-boat six or seven years ago, due north of Cleveland. Witness states that he has fished around the island on both sides, and he got the most fish on the north or Osage side as there was more water. Witness states that there is water in the channel on the north side between the island and the Osage county all the time. On the south side of the island, from the best of his recollection and his observation during his trips down the river about a dozen times a year from 1893 to the last two years, the water would have to be swelled a little to be there. Witness states that the condition of the channel between the island and the land on the south is sand. This channel, witness states, extends the length of the island and is deeper on the upper end than it is on the lower; that is, there is more water. Sometimes, he states, when he was seining the water would be knee deep and sometimes a little deeper, owing to the amount of water in the river. When the water is high up, witness states, it has been deep enough to run a steamboat around. Witness states that he never attempted to cross the south channel with a wagon at any time, as he had too much sense for that. He states that there is quite a little bank on the south side of the bed of the south channel. Witness states that the bed of the channel is changing. There may be a hole, and after a rise the hole will fill up and there will be another one some place else, the soil in the bed of the river being sand. He

states that he has never seen any vegetation on the bed of this channel. Witness states that there is no difference between the sand of the bed of the river on the south side of the island and the sand in the bed of the river proper. As near as he could find, the whole river is just about the same all over. He states that the most water flows on the north side of the island. He states that there is no difference in growth of the timber on the island and the mainland; also that
 660 he has seined on both sides of the island.

Cross-Examination

By Judge Dillard:

Witness states that at the time he fished in the channel on the south side of the island the river had been up before, or was just coming up, as that is the best time to fish. Witness states that he has never been on the island continuously, but he has seen the water run around it some years. On his fishing trips, witness stated that he remained a day and would return, and the conditions mentioned by him were the conditions he observed on his periodical trips. Witness states that when the water was up a little he had pretty good success in navigating a boat down the river. He has also attempted to navigate the river when the water was at its ordinary stage and got along all right as long as he kept in the channel. At times he stated, there were thin places that he had to get out and pull the boat over. Witness states that he ran a boat forty-two feet long and twelve feet wide up the river north of Cleveland when he knew it to be low water, and that one time the boat broke away and went three or four miles down the river, the water at that time being just about an average. At the time the boat broke loose it was loaded. This boat, witness states, was a ferry boat, and that he never traveled any where else except up and down the river about Cleveland with her. Witness states that the only navigation he has ever done in the Arkansas river with a boat was the ferry boat that he speaks of going from one shore to another; he states, however, that he rafted logs in the river about seven years ago. These logs, witness states, he rafted on a two foot rise in the river to a point where he wanted to cut them into shingle timber, part of them a distance of a couple of miles to the mill where he wanted to cut them. Witness states that he has been on Mr. Thomas' farm, that there are places on the farm where the water overflows and leaves a sand-bar, but
 661 there is not as much sand at these points as there is out in the channel south of the island. Witness states that where the river overflows, the floating sand will go out but the coarse sand won't. Witness states that he does

not recollect the character of the soil on the island as he has never worked on the island. He states that most of the islands are sandy soil but mud and dirt will settle on them like it does anywhere else. The body of the island is sand so far as he knows and it would appear that the island is a bank of sand that has been thrown up some time by the river.

Cross-Examination

By Mr. Taylor:

Witness states he never worked on the island, nor has he had much business there. He states that there are large trees which are a little denser on the north end than on the lower end of the island. He never paid much attention to them, though, nor did he pay any particular attention to the soil so as to be able to state what kind it is. Witness states that the south channel has built up some since he first knew it—they all fill up some. As to the north channel, witness states, as he explained before, it might be deep today and a little rise may fill it up and move the channel to another place. He states that he has never made an examination along the south side of the island to see whether there was any made land on that side. During the first two years, witness states there was plenty of water going around the south side of the island but later it had decreased in quantity—the whole river has, and during the time that he went to the island to fish there was always more water running around the south side of the island than there is now. As he stated before, there is more water at one time than at another. When he wanted to fish there was always water but there were other times that he went there when there was no water. Witness states that the channel was well defined on the south side of the island and it was different from the land on the island and on the Thomas farm.

Recross-Examination

By Judge Dillard:

Witness states that he has not talked to any one about this case before he came on the witness stand, nor did he know anything about it until he was subpoenaed to come.

662 He states that he spoke a few words to Mr. Crockett about the river but not much about the island. He also talked to Mr. Lunsford about it. Witness states that when he said he did not talk to anybody about the case he meant outsiders. Witness states that Mr. Crockett and Mr. Lunsford had not asked him practically the same questions about the island they have asked him on the stand, nor have they told him what their position was in the case and what

they wanted to prove. He also states that all he knew was that they wanted to know about the river, the channel, and so on, that they have been talking about, and it will be found in the affidavit that way also.

Redirect Examination

By Mr. Crockett:

Witness states that when he was spoken to in reference to this proposition he stated that he didn't know much as he had not seen the island for two years and when he told Mr. Dillard he had not been talking about the island he meant that he was acquainted with the river and he did not mean that he had not been talking about the river and other things. Witness states that Mr. H. A. Thomas spoke a word or two to him about the island in some way or other but he does not recollect how it was. The ferry boat that he states broke loose and went down the river two and one-half or three miles stopped above the island, and the ferry landing was about five or six miles above the island.

Defendants here offered testimony of E. G. CARTER in the Nolegs case:

Direct Examination

Witness states that he is forty-four years of age and came to Cleveland in 1903. He states that he is working in the oil fields at Cleveland and has been in that business for five or six years. Witness states that he looked at the island in controversy in this case yesterday but he had not paid particular attention to it before. Before he went into the oil business, witness states he was in the real estate business, and in the year 1908 he made a trip on the Arkansas River. This trip he made from Cleveland to the mouth of the river in a gasoline boat twenty six feet long and six feet beam, and eighteen inches draft, with a six horse-power engine. On this trip witness was accompanied by his cousin as far as the mouth of the river. He states that he did not stop at the mouth of the Arkansas river but went on to Vicksburg, Mississippi, in the boat. Witness states that this trip consumed about three months as he would stop along two weeks at a time at the different places. He left Cleveland and about the month of May at a low stage of the river—not very much higher than it is now. Before he started witness stated there had been no rain to cause any rise in the river but after there was a local rain and this rain occurred between Cleveland and Tulsa and increased the flow of the river about eight inches. This rise in the river lasted about twenty-four hours and

on the trip down there were other rains. Witness states that at the time he started on this trip the river was a little higher than it is at the present time though he has not observed the river very much of late. Witness states in coming to the island yesterday he left the wagon road midway of the island opposite Mr. Thomas' place on the southwest bank of the river. When he got out of the wagon, witness states, he was on the bank, and in going down there was an incline of about eleven feet to the river. This distance he judged while standing down in the bed of the river and looking back up on the bank. Witness states that there was a camera located opposite the place where he was standing in the bed of the river, the foot of the camera being about five feet higher than his head, and witness states he is six feet tall, making an eleven foot bank. He states that where he was standing in the bed of the river it was sandy but on the bank before he went down it was soil and sand of a dark color. There were also trees on the banks but he did not see any trees or vegetation in the bed of the river. In going down to the bed of the river, witness states that he went in a northerly direction towards the island, going straight across. He states that he counted two hundred and twenty-three steps to the island from the place that he went down to the bed of the river. The soil in crossing was sand which he sank in two or three inches. Before reaching the island, witness states he found running water. This water he crossed on a
664 pole under which the water ran. When he crossed the water, witness states, he went down the river to the lower end of the island and came up on to the island from the other side. The soil on the island, witness states, looks pretty good and was about the same character of soil on the Thomas land where he got out of the buggy. Witness states he saw a number of different kind of trees on the island, principally cottonwood. He also noticed an ash tree; the ash tree, witness states, measuring it from an off-hand glance, being about nine or ten inches in diameter across the butt. Witness states that in crossing the bed of the river he did not notice any vegetation but he did notice the channel between the island and Thomas' land up and down the island which looked very much like where he crossed it. He states that in going down from the place where he crossed to the end of the island the soil was the same as where he crossed. Witness states that there is no difference in the soil that he observed in crossing the channel and that along the channel and the other soil in the bed of the Arkansas river. The water which he crossed in the south channel ran from four to twelve inches, and witness states that he saw some small fish in it. He states that

he saw the channel on the north side of the island and there was considerably more water on the north side than there was on the south side and that you could have run a light draft boat in the north channel. From the south edge of the island, witness states, he went up the north side walking entirely up the north bank towards the Osage side. On this north bank of the island, witness states, the bank was abrupt and about eleven feet above the water the same as the other banks on either side of the river. From the north edge of the island witness states he walked up stream about half a mile until there was no island at all. The condition of the bed of the stream at this point was a sand-bar and he found no difference in the sand there than at the point between the island and Thomas' land. Witness states that a half a mile above the island the river bed of the Arkansas runs on the north
665 or Osage side. When he was at this point yesterday there was a sand-bar on the south side of the river and half a mile above the island. Coming down the river bed from the north of the island, witness states he went between the island and the south bank, or between the island and Thomas and Edminston's land, returning to the point where they started so that he walked upon the entire channel between these two points. Witness states that the south channel averages about two hundred yards in width and that he did not see any vegetation any where along the channel, nor any indication of a difference in the soil of the river bed from any other part of the river. In places in the south channel, witness states, the water was four or five feet wide, and other places seventy-five feet wide, from four to ten inches deep. In two places, witness states, the water disappeared into the sand and he could walk across dry shod. These places were from one hundred to two hundred yards long. In places between the pools the water was running and the pools were from a foot to two feet deep and fifty to seventy-five feet wide. While he was in the south channel he states he observed where there was not any running water the condition of the sand was damp; he also states that he was with the photographer when a number of pictures were taken.

Cross-Examination

By Judge Dillard:

Witness states in answer to the question as to how much he was paid to be a star witness that he expected to get his witness fees. He states that he got \$5.00 on account of his expenses and that he had no agreement whatever regarding his trip over the island yesterday. Witness states that he has been living at Cleveland since 1904 and that he is working in the oil fields as a roustabout pumping oil. At present, he

states that he is working for the Minnetonka Oil Company. Witness states regarding his trip down the river the day previous that Mr. Lunsford came to his hotel and asked him to take an automobile ride with him. He did not know where they were going but got into the automobile and went along. Besides Mr. Lunsford, Mr. Crockett and Mr. Lunsford's son accompanied him. Witness states that his attention
666 was called to the fact of the running water; he also states that the height of the bank was mentioned to him, which they talked about. On this trip, witness states, different features were mentioned, and in going over the upland the different things that he has testified to in his testimony, including the condition of the island, were talked about generally. Witness states that he knew the purpose of his trip was in connection with his being a witness. He states that the water was running around the island from one pool to another and that all the water he saw on the south side of the island was in pools. Witness states that while there were places between the south side of the island and the mainland where there was no water visible on top, the sand was damp. Witness states that he did not observe that the bank where the photographer took the pictures was any different from the bank along that side of the river. The photographer, however, was told where to set his camera. Witness states that the north end of the island where he said the sand-bar was, the water was not running from the river around into the soil or sand-bar on the south side. He states, however, that the water in the pools could not come from rains as there had not been a rain in the last month or two to make running water. He states that he did not know how long the water had been there or that the water had not been in the different pools since the last rain. He stated that it did not seem probable that the rain of two or three months ago would make running water, according to his opinion. Regarding the black soil which he stated was on the bank of the island, witness states that there may be some sand mixed with it but it had the appearance of being dark. Witness states that he did not know that the slough in the middle of the island had water in it all the time and that slough cut out into the island on the side next to the island and out into the sand-bar on the side next the sand-bar.

Cross-Examination

By Mr. Biddison:

Witness states that he saw the water coming out of the same in some places. He states that he did not see the water boil-

ing up but that there could not be running water unless
667 it came through the sand. He states that the pole that
he walked across over the water was lying across the
water when he went across.

Cross-Examination

By Mr. Taylor:

Witness states that the water he saw flowing in the pools was on the south side of the island next to the island and that he came to a chain of pools before reaching the island as he crossed the channel from Thomas' landing on the south. Witness states that there was running water that was visible going from pool to pool in the south channel; he states that there is evidently some current of water on the south side of the island flowing from the upper end that joins the other channel of the river at the south.

By Judge Dillard:

Witness states that the water would have to rise two and one half or three feet from the stage of the water in the river as he saw it to flow over the sand-bar at the upper end of the island around the channel. He states that he did not see any rise in the river, nor did he know that the water was higher than it had been for some time past.

By Mr. Crockett:

Witness states that when he saw the running water in the several places mentioned, the photographer took a picture of the running water but he has not seen the picture. He states that he observed ripples in the stream on the south side of the channel in two places. He states that he was present with the photographer when he took pictures of practically the entire channel of the island and that his picture is in several of the ones taken by the photographer. He states that the bank on the south side next to the road looked about the same to him though he did not pay particular attention to it. Witness states that he observed the bank on the south side for the entire length of the island. He also states that while there he saw some surveyors and that he talked with Mr. Lunsford, with Mr. Crockett, and with all the parties on the island along
668 the entire way. Witness states that he walked practically all around the island with the other people and that he was there about four or five hours.

By Mr. Biddison:

Witness states that the ripple in the water that he saw on the south side of the island was caused by the flowing current going from one pool into another. Where the water was

still, it was froze up. This running water, witness states, ran to the pool below it.

By Judge Dillard:

Witness states that there was ice over the pool when he saw it "yesterday" and that the water that he saw running was not from the melting ice as it was too cold to melt even though the sun was shining.

By Mr. Crockett:

Witness states that he got pretty cold and that where he saw the water running there was no ice because it was in motion but where it was perfectly quiet there was a thin cake of ice over the water. He states in the main channel on the north side there was floating ice, and pictures were taken of the ice floating down the north channel.

By Mr. Taylor:

Witness states that as he observed it there was a well defined channel with a well defined bank on Mr. Thomas' side of the river, and a well defined bank of the island on the opposite side. He also states there was no vegetation in the bed of the channel between Mr. Thomas' land and the island.

By Mr. Crockett:

Witness states that Mr. Lunsford has not at any time suggested anything that he should testify to, nor has he talked to him about anything in reference thereto. Witness states that he made observations the same as any one else, and has testified to them as they occurred to him.

By Judge Dillard:

Witness states that he talked with the man who accompanied him on his trip to the island about matters that he has testified to.

669 Defendants here offered testimony of J. W. JOURDAN in the Nolegs case:

Direct Examination.

Witness states that he has lived in Cleveland since 1883 and that his present occupation is farming and stock. He states that he has done some traveling up and down the river, but not much. On one occasion he states he rafted cedar piling down to Tulsa from right close to where the Cleveland wagon bridge is on the river. This, he states, was in 1885, and the raft was about 350 feet long made of logs laid crosswise, lashed together with wire. Witness states that he was familiar with

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the island in question in this suit which he considered a sand bank. He states that he was also familiar with the bank of the river on either side. He states that at the time there was timber on the island consisting of pretty large cottonwoods. From observation he judged the island to be from fifty to one hundred acres. At that time, witness stated, there was a larger amount of water on the Osage side of the island and that is the side he went with his raft. Witness states that the banks of the river on the north side of the island were well defined just like they are now all the way along the island. While he could not estimate the height of the bank above the water he noticed that the highest water, since he has been there, was in the Spring, 1885, and that did not go over the Osage bank at the time. He states he ran over most of the island, nearly all of it being covered with water. He states that the bank on the north side of the island was well defined as far as he saw. Witness states that whenever the river was up the water ran around the south side of the island and there was a well defined channel on the south side of the island. The rise in the spring of 1885 increasing the cut through there making it a little deeper and some broader than it was before. The channel opposite Mr. Thomas' land, witness states, was an open waterway whenever the river was up a little and when the water was down there was no water in the channel

at all except little pools. He states that the vegetation
 670 was entirely excluded from the sand part of the channel and that the width of the channel on the south side of the island opposite the land now claimed by Mr. Thomas, from a guess from his experience in traveling in that neighborhood, is about eighty or one hundred yards wide. He states that this width continued the entire length of the Thomas land. This, witness states, was in 1895. He says that the country was opened up in September, 1893, and from 1885 to '93 he was familiar with the channel through there. Witness states that he and his son cut a road from Leroy at the mouth of the Cimarron up the river going right by the island. The Cherokee people were expecting to locate tracts for homes on part of the land of Mr. Thomas, and he and his son made a field fifteen or twenty acres. The road which they made was between the field and the river along the river bank. He states that the condition of the channel during the period that he has mentioned from 1885 to 1903 was not changed much after the rise of 1885. He also states that during that entire time the vegetation was excluded from the bed of the stream; he states that for some distance from the sand bed up to the main body of the land on the bank on the south side of the

river opposite the island there was some pretty good bottom land with timber on it. This bank, witness states, was well defined towards the lower end of the island but at the upper end it sloped off gradually in different benches until it got down low. As to the island, witness states, that is sloped more to the Pawnee side than it did to the Osage side. Witness states that when the water was up he went down with his raft on an eight foot rise and while there was quite a volume of water running through the south channel he was afraid to tackle it, and at the main channel the water, witness states, was eighty or one hundred feet wide and reached out into the young growth on the Pawnee side and clear up to the island. He states that while there was quite a current it was not as strong as the main current that went around on the Osage side. The main current, witness states, must have been forty or fifty yards wide. The water on the Pawnee side spread out on the 671 slopes on the island and on the bottom. Witness states that the occasion of the deeding of the land to the Osages occurred in 1883, and some of them were camping in the valley when he moved there but they pulled up and moved on their side. These Indians, he states, had no stock on the island or anything else. He states that the only person he knew of having anything on the island was the man Flight, who put a house on it. After the execution of the deed, witness states the Osages went back to their side. They left as quick as he moved in.

Cross-Examination

By Judge Dillard:

Witness states that he first became acquainted with the island in 1883 and he observed it continuously up to four or five years ago. He states that he never knew any Osages to occupy the island. He states that there was a volume of water that went through the channel on the south side of the island whenever the river was up some. When the river was not up he states he saw no water except along in puddles. Up to the time of the big rise in 1885, witness states it would have taken something between three and four feet rise to run the river water through the channel south of the island. After the big rise he states that a couple of feet would have put some water through. He states that the river when it was low did not run around the channel at all, nor did it do so when it was medium low. Witness states along in 1883 there would be about three months of the year that there was no water running through the south channel. Since the rise of 1885, witness states that he could not notice much

change. Witness states that the island is mostly sand and made land—sediment settled from overflow. The island forming as it did would catch the sediment from the overflow—a kind of soily muck mixed with the sand, while down in the bed of the river there would be nothing much but sand. Where there was vegetation there would be a sort of thick muck or mud soil top of the island. Witness states that where the water runs on to the Thomas and Edminston's field in times of high water, he does not think it settled as much sand as it does

in the bed of the river, it settled more muck with the
 672 sand. Witness states that he does not know of any successful effort to navigate the Arkansas river for commercial purposes in Pawnee county since he has known it. He states that he remembers the Arkansas Millers, that she went down with a load of wheat or flour on a big rise and came back on quite a rise with some lumber. The last he knew of her she had run aground and wrecked by the mouth of Black Bear, on this return trip. Witness states that when the river is at its ordinary stage, not on a rise from recent snows or rains, nothing but a boat drawing very little water could run along the river in Pawnee County for any distance. He states that in low tide no boat could successfully run on the Arkansas river through Pawnee County. Witness states that he was with Captain Burris, United States Engineer from the Mississippi Division, who was surveying the river from Wichita to Fort Gibson. He states that he furnished him his meals through the open country until he got near Tulsa. They traveled on two long boats built perfectly flat-bottomed. These boats were lashed together. On several occasions they were obliged to unlash the boats and the force of men had to drag and pull them over sand-bars and low places. This, witness states, occurred in 1884. Referring to the banks on the south side of the island upon the island, witness states that his recollection is that in the early days when he was most familiar with it, along towards the lower part of the island there were pretty good banks, all the upper sides sloped more gradually to the bed on the south part of the island. Witness states that the bank on the north side of the island where the main channel of the Arkansas river is, looked as high as the Osage bank towards the north end. Towards the upper end of the island he states there was not much of a defined bank, it was just a gradual slope—a sand bank down to the bed. On the Thomas side the bank was sloping but not exactly like the island, part of it being benches covered with growth of willow and such. Witness states there was no regularly defined bank that the recollects on the

side of the sand-bar. It sloped down gently from the island to the bar.

673 By Mr. Crockett:

Witness states that he settled in January, 1883, about three miles and one-half from the island at the point where Cleveland is. He states that he traveled along the [short] opposite the island during the time that he cut the road through there and passed the island about once a week on an average from 1883 on up to 1888. Witness states that in the summer of 1885 he was commissioner by Chief Bushyhead as agent for the Cherokee Nation to protect their range covering six million twenty-two thousand five hundred acres, under the system which they had with the Cherokee Live Stock Association for grazing cattle. He states that his active service as representative of the Cherokee Nation terminated in November, 1887. The boundaries of the strip of land that he had control of witness states, on the north was the Kansas line, two miles west of the one hundredth meridian; the Panhandle country was the west line; and the line that comes up by Tulsa from Choteau on Grand river west by the mouth of the Cimarron west to the same destination that the north line did. He states that the services performed by him were under Section 2117 U. S. R. S. in regard to intruding herds of cattle on ranches. He licensed one hundred and four ranches on the strip by grazing licenses on the Cherokee strip. The intruding herds that came in and grazed he had to move with military. Witness states that he had access to Col. Wade's 5th Cavalry most of the time; he also had Hatch's 9th Cavalry, niggers. Witness states that while he did not have authority over Osage county he did over Pawnee County so that he considered the land on the Pawnee side part of the 105,456 acres east of the reservation under his control. After his services terminated as representative of the Indians, witness states he remained there as a ranchman and farmer, at Cleveland, until the present time.

By Mr. Biddison:

Witness states that the Pawnees took their reservation prior to the time he came to the neighborhood of Cleveland, but he does not remember the exact date. Witness states at the time he came to Cleveland the land in that neighborhood was owned by his family—Cherokees, and it belonged
674 to the Cherokee Nation. The Cherokee Nation parted with the land upon the close of the treaty the last days of Congress in March, 1893. Witness states that he knows that he know that he moved to Cleveland in 1883. He had a record

showing the dates but they have been burned up in his house which burned a few years ago and all his papers were destroyed. He states that he had been through that country prior to this date and his attention was first called to the island when he traveled up and down by it. He states that his son settled at the mouth of the Cimarron where Leroy is now, and he and his son cut a trail or road out right by the river by the island. He passed back and forth from the bend at Cleveland down to that bend. Witness states that at the time, according to his observation, there was more than six months during the year that there was water running around the island on the southwest side; that is, it would average that—some years there is a great deal of water in the Arkansas river and some years very little. He states that some years there was pretty close to nine months water. There was no difficulty, witness states, in deciding that water passed through the south channel when the river was up, and little at the time that he was there. Witness states that his observation of the island was as he passed up and down the road on the Pawnee county side, also around the island; he states that he had cattle that would graze on the other side and he frequently crossed right at the head of the island on horseback looking after cattle. He states that he crossed at the head and bore down the stream to get out down on the other side. Witness states that the Osages used to come over on his side to hunt during the Fall. The names of some of the Osages who came over on his side, witness states, were Ma-che-lak-i and Dick-hi-ka-wa-ki. He also states that old man Clearemore was a Chief. Black Dog, Wa-she-to-be, and Black Bear were some of the other Indians who came over on his side. These hunts of the Indians would extend clear down across the Cimarron. Witness states that the rise of 1885 was the highest he has known in the river since he has been there. This rise, he states, did not go quite over all of the island but it would be hard to tell because when the river was at that stage it was

675 a mile wide and covered the bottom clear up to Mr. Thomas'. He states that there are some parts of the island that are higher than parts of Thomas' land, particularly the benches where it drops off, and the sloughs running through Thomas' farm are lower than the top of the island. He states that he thinks it would take an extraordinary rise to cover all of the island. The first time he saw the island, witness states there were large cottonwood trees on it. He noticed these on account of the eagles building their nests in the trees. The eagles build along the river to fish. While there were other trees besides the cottonwoods,

they were the only large trees he noticed, they being larger than the other trees. Witness states the first time he knew the island there were well defined banks to the channel on the north side—both the bank on the island on the north and the bank on the Osage side. Witness states that he is sixty-eight years of age.

By Mr. Crockett:

Witness states that he frequently crossed the Arkansas river at the north of the island towards the Osage side and at that time the main channel of the Arkansas was next to the Osage landing. When the river was low most of the water passed on the north side. He states that the channel was on the north side and never got dry that he has seen whereas the south channel would be dry sometimes three or four months in the year. Witness states that he has never known the banks on the Osage side to overflow along that point. Witness states that the banks on the Thomas and Edminston side would overflow and the water would go through towards the mountains. He also states that some of the sides of the island on the south were slanting some at that time. He states that when the river got high and the water got on to the island, there was a small part of it that the water never got over. During these high water times, witness states that he could see the big trees that stood up, and the small brush would be pressed down by the current, the bigger portion of the island being submerged. These high rises, witness states, would leave deposits of sand and dirt on the island, it also piled brush on the island, as well as driftwood. He states that this rise of 1885 was the biggest water that covered all the overflow land in the bottom.

676 Witness states before he moved into that country he lived on the river by Muskogee, and at the time he was married. He married the second time in July, 1882, and in 1883, he moved to Cleveland. He states when he first went to Cleveland, his son that was living down below the island was eighteen or nineteen years old. This son, witness states, was living two miles above the mouth of the Cimarron eight or nine miles by river below the island. He states that he cut all the first roads they ever had. Witness states that he moved up to Indian Territory the year after he was married to his second wife in 1882 and he does not think that he could be mistaken about the date. He states that he lived at Cleveland for two years before his first child was born there.

By Mr. Biddison:

Since he has known the Arkansas river witness states that he has not known it to be used for purposes of trade and transportation in its ordinary stages not affected by any rise. In times of extremely high water he states you could not get close enough to the island to see it unless you were on the river. Witness states that in 1885 he went down on a raft on the first rise, an eight foot rise, to Tulsa; another rise followed him of about as much more and as he went down on the north side of the island he could see everything bending which gives him the idea that the second rise pretty near covered everything.

By Mr. Taylor:

Witness states that the eight foot, or first rise, left quite a little of the island out of the water so you could see it, and his idea is that the succeeding rise left a small part of the island as high as the Osage side uncovered. Witness states that the date of the Cherokee deed to the Osages was in 1883. He does not remember the exact date but it was the same year that he went into that country. He states that while the channel of the Arkansas river, as he observed it, is always subject to change by filling and cutting, the banks do not often change. Witness states that the current of a stream often changes from one side of an island to another but that the channel of the island above the bridge opposite to Cleveland has not changed since he has been there. As
677 to the island below the bridge, witness states, the river nearly always ran when there was any stage of water on both sides of that island. He states that the first time he observed the island in controversy it must have embraced fifty to eighty acres covered with brush timber and large cottonwoods. He states that the channel next to the Osage side of the island was little wider than the one on the south side of the island when he first saw them, the Osage side be estimated being at least three or four hundred feet and the other somewhere from two to three hundred feet on an average. Witness states that he cannot say there was a steady cutting away of a portion of the bank on the Osage side, and on the Osage side of the island, while there was a steady filling in on the south and west side of the island, though he has not been familiar with it at all for the last five years. He states that the only cutting he has noticed that amounts to anything was in '85. He also states that he has not had any reason to pay particular attention to the

island except in passing round it, the same as any other island up and down the river, he sees casually in the stream.

Defendants here offered testimony of E. G. GRAY, in the Nolegs case:

Direct Examination

Witness states that he has lived at Pawnee pretty nearly nine years, and from 1874 until the time that he moved to Pawnee in May, 1903, he lived at Arkansas City. He states that he lived in Arkansas City twenty or thirty years and while there he was working on a newspaper—The Arkansas City Journal. He states that in the summer of 1878 while he was living at Arkansas City a flat-bottom steamboat called the "Aunt Sally" came up the river from Fort Smith, Arkansas. The size of this boat, witness states, was eighty-five feet long, eight feet wide and drew twelve inches light and eighteen inches loaded, sixty-five tons burden. Witness states that he went on this vessel frequently and on Sunday afternoon, June 30th, she carried over three hundred people. The boat, he states, had a regular deck and a hurricane deck. The boat came to Arkansas City, but once making three or four trips up and down the river that afternoon to accommodate travelers. It also made several trips on the Fourth of July. According to his recollection, witness states these trips extended for five or six miles down the river from Arkansas City.

Witness here, to the following questions made the following answers:

"Q. Have you any memorandum or paper by which you can refresh your memory with reference to this?

A. I have a copy of the Traveler published that week I have kept ever since.

Q. Can you consult this memorandum and after refreshing your memory tell me, can you remember any other points between which this vessel plied? That is, then between Fort Smith and Arkansas City?

A. I don't remember now.

Q. Did you write that article? A. Yes, sir.

Q. Is it true? A. Yes sir.

Q. Please read it over and see—

A. Do you want it read out loud?

Q. No, read it to yourself.

A. The information in the article was gained from the captain of the boat and owners of the boat that the boat plied

from Little Rock as well as Ft. Smith, and the figures are taken from some kind of a certificate that was tacked on their pilot house, was a certificate authorizing the boat to ply, these figures as to its length and its draft."

Witness stated that at that time for from three to four months a year the river was considered navigable for boats of that size and of course they thought it was just a matter of a few years until a line of boats would be established. In the winter time, he states, no effort was made to navigate the stream. He states that the river on an average would be navigable three or four months every year.

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Cross-Examination

By Mr. Biddison:

Witness states that since he has known the Arkansas River it was generally used for purposes of trade and travel up to Fort Gibson and from there on up as the stage of water permitted. Witness states that in '78 or '80 it was a matter of common knowledge that there was traffic up to Fort Gibson. Fort Gibson, he states, is now in Oklahoma. From Fort Gibson on, witness states, he does not think the river has been regularly used for the purpose of trade and travel. He states that there was a boat built near Arkansas City for trade and travel on the river that went down the river but he does not know whether it ever tried to come back, his belief being that the boat cargo and all was sold. This, witness states, was the only boat used for travel other than the "Aunt Sally" that he knows of. He states that the use of the river within the present range of Pawnee County for the purpose of trade and travel has never been resorted to except in [insolated] instances during his acquaintance with the river, and then only at times of high water. Witness states that at the time the "Aunt Sally" came up the river it was largely a matter of experiment, and so far as he knows the owners of the boat did not lose any money on the trip. Witness states the boat tied up at Harmon's Ford at the mouth of the Walnut and from there made short trips down the river to see the scenery and the water. Witness states that the boat remained until it got a load and then went back but he does not think it got back. He states that the people, as a matter of encouragement to the boat, shipped flour and stuff down the river.

By Mr. Taylor:

Witness states that it was the general belief that the Arkansas river carried enough water, and with the assistance of

dredging through some sand-bars the river would be navigable. He states that the owners of the "Aunt Sally" told him that they had no doubt of the feasibility of the river being made navigable up to Arkansas City. He states that they all thought that the only thing needed was a little assistance in the way of an appropriation from Congress,—the share of the appropriation for the Arkansas that went to all rivers.

680 By Mr. Biddison:

Witness states that the purpose of the trip of the "Aunt Sally" was made in the hope of attracting Congress' attention to the river as far up as Arkansas City.

By Judge Dillard:

In reply to a question as to whether Congress did have a survey made as to the navigability of the Arkansas river by a man by the name of Burriss, witness states that he does not recollect the name of the man who made the report but it is his recollection that the investigations made of the river were abandoned because it seemed impossible to get Congress to take any interest in it. He states that the trip of the "Aunt Sally" is the only one that has ever been made up there. This trip, he states, was made in June and July and that the river is always highest in the Spring and summer until August caused by the melting of snows in Colorado and the mountains above.

By Judge Stuart:

Witness states that he knows from general reading that the Arkansas river has been considered by the War Department as a navigable stream but he does not know whether four separate appropriations have been made to improve the Arkansas.

By Mr. Taylor:

Witness states that he always considered that there would be an increase in the volume of water in the Spring time, and that was a probability that could ordinarily be depended upon.

Defendants here offered testimony of ISAAC D. TAYLOR in the Nolegs case:

Direct Examination:

Witness states that he is Assistant United States Attorney for the Western District of Oklahoma, and is representing the

Indian defendant, Larry Nolegs, in the litigation involving the island in controversy. He states that this representation is by virtue of his office, the law directing that the United States Attorney appear for the Indians that are still incompetent. Witness states that there was a request made by his office to the War Department in reference to the navigability of the Arkansas river. This request was made by letter 681 of the Attorney General for a report from the War Department as to their attitude on this question. In reply to his request, witness states, he received the letter dated October 18, 1911, signed "For the Attorney General, Ernest Knaebel, Assistant Attorney General", together with an inclosure dated September 25, 1911, signed "For the Attorney General, Ernest Knaebel, Assistant Attorney General"? and another inclosure dated October 11, 1911, signed by some one as Acting Secretary of War. Witness states that this communication was received from the post office at Guthrie in due course of mail. He states that he found it upon his desk together with other mail unopened in the envelope marked exhibit "KK". This envelope, witness states, was sealed, the seal broken by him, to the best of his recollection, and the letter contained therein and two inclosures marked exhibit "JJ" taken out. The letter, and inclosure marked exhibit "JJ", together with the two inclosures, witness states is a part of the original files in the United States Attorney's office for the Western District of Oklahoma. In response to a question by Mr. Ledbetter as to whether these were his instructions with reference to this litigation, witness states that in a way they were. They show the attitude of the Government.

(The letters referred to are found heretofore in this record and are letters written by Robert Shaw Oliver, Acting Secretary of War, and Ernest Knaebel, Assistant Attorney General.)

Defendants here introduced the testimony of HUGH PITZER in the Nolegs case:

Witness states that he is superintendent and special disbursing agent of the Osage Indians at Pawhuska. As such officer he has in his charge all records pertaining to the affairs of the Osage Indians. He states that he also has records in reference to the island in controversy. With this record, witness states, he has the field notes of a survey made by C. E. Reffield under the direction of A. F. Dunnington, made February 27, 1908. This record, witness states, is part of the

682 official record of the United States Government, and Exhibit "LL" has been compared by him with the official records about which he has testified. He states that exhibit "LL" is an exact copy of the records in his office.

By Mr. Ledbetter:

Witness states that the instrument he holds in his hand is the field notes of a re-survey of the sub-division lines of the fractional townships, 21 N., R. 8 E., Osage Indian Nation, and are the records of his office. These records, witness states, were sent to him as part of the files of his office by the Commissioner of Indian Affairs, Department of the Interior, United States Government. This Department, witness states, has control over the public surveys of the United States and the field notes of these surveys. These field notes are read into the record as follows:

Meanders

T. 21, N., R. 8 E.,

Meanders of Western Portion of island in sections 25, I commence at the meander Cor. of frac. sections 25 & 30 on E. bdy. of Tp. on N. shore of island, heretofore described. Thence I run with meanders in Sec. 25 on right bank of N. channel of Arkansas River up stream, along N. shore of island. Through heavy timber, and dense undergrowth.

Bank 8 ft high.

N. 57½ W. 9.00 chs. At 7.60 chs. John Flight's house bears S. 100 lks dist.

N. 67 W. 6.40 chs.

N. 57 W. 8.00 chs. Bank 6 ft. high.

N. 41 W. 4.20 chs.

N. 69 W. 2.90 chs.

N. 51 W. 4.60 chs.

N. 74 W. 1.90 "

N. 80 W. 2.10 "

S. 55 W. 6.00 "

To Western end of island,
thence on left bank of S.
channel of river down stream.
Thence along S. shore

S. 42 E. 2.80 chs.

S. 51 E. 5.70 "

S. 85 E. 2.50 "

S. 38 E. 6.60 "

S. 48 E. 6.70 "

S. 65 E. 4.30 "

At 3.00 chs head of dry slough
25 lks. wide, course E.

S. 56	E. 9.60 chs	
S. 74	E. 4.00 "	
East	2.80 "	At 2.00 chs. mouth of same slough, 40 lks wide, course SE To M.C. of frac. sections 25& 30 on E. bdy. of Tp. on S. shore of Island, heretofore de- scribed.
S. 60	E. 2.00	

683 [Lnad], nearly level, soil alluvial, 2nd rate, Timber Cottonwood, Willow, Box Elder, Sycamore, Walnut, Mulberry and Elm, Undergrowth, Willow, Cottonwood, and several kinds of vines.

Feb. 27, 1908.

At this cor. i set off 8 38' S. on the decl. arc. and 12h 13m. 5 S. P. M. 1., t. observe the sun on the Meridian; the resulting Reading of the 1st. arc. in 36 16' which is the proper 1st. This island is principally covered with heavy timber and dense undergrowth. The soil is alluvial, and capable of producing good crops.

The island is nearly level, and not subject to overflow in ordinary high water. The island is claimed under the U. S. homestead laws by John Flight, who resides thereon, but who is not an Osage Indian.

Feb. 27, 1908.

[—] Mr. Pitzer, I will—have you a certificate of the General Land Office to these notes in your possession?

A. I have.

Q. I will ask you to read it in evidence.

A. (reading) Office of the General Land Office, Washington, D. C., January 15, 1909. The foregoing field notes of the survey of sub-divisions of fractional township 21 N., R. 8 E., as kept by C. E. Redfield, U. S. Surveyor, under direction of A. F. Dunnington, topographer in charge, under his instructions dated December 3d, 1907, having been critically examined and the necessary corrections and explanations made, the said field notes and the surveys they describe are hereby approved. Signed Fred Dennet, Commissioner of the General Land Office.

Q. Is that the certificate? A. Yes sir.

Cross-Examination

By Judge Dillard:

Witness states that the survey of this particular Township was commenced July 13 and completed July 23, 1908, and made by C. E. Redfield under the supervision of A. F. Dunnington, topographer in charge. He states that instructions for this survey were dated December 3, 1907, and a plat called "Re-Survey of fractional T. 21 N., R. 8 E., of the Ind. Md. Okla.," is made from the field notes of that survey as it appears. Witness states that he has the field notes of the survey made by J. P. Walker and C. E. Redfield in January, 1908, under A. F. Dunnington. That, he states, is of T. 21 N. R. 9 E., which is the Township on the other side of the same range line.

Defendants here offer in evidence from page 627 of the same record the report of the Kansas State Board of Agriculture, which reads as follows:

684 Navigation of the Upper Arkansas River.

The question of utilizing that vast, though ever-changing current of water, known as the Upper Arkansas River, flowing through our State from west to southeast, and making it the highway to a southern market, has been a living subject with the enterprising agricultural people of Cowley, Sumner, Sedgwick and those counties lying along and contiguous thereto, ever since the first settlement of that fertile valley in 1870. Owing to their remote distance from a railroad or a market, and the consequent cost of transporting the vast surplus of wheat raised in Cowley and Sumner, has this matter been of vital interest to the people living within the borders. The subject has been discussed in the field and in the grange; has been the slogan of the country politician and the shibboleth of the farmer. It has been resolved upon by conventions, petitioned for by representatives and memorialized by our State Legislature until Congress has taken the matter under consideration, and appointed a commission of competent engineers to personally visit, examine and report on the feasibility of opening up the stream for navigation, from some point near the terminus of the Wichita branch of the Santa Fe Railroad to Little Rock, Arkansas.

In view of these facts, a brief account of the local and individual efforts to solve the problem will doubtless be of interest. During the fall of 1875, A. W. Barkey and A. C. Winton, of Cowley County, built a small flat-boat at Arkansas City, loaded it with flour and started down the river,

bound for Little Rock. While they may not have had the "unexplored wilderness" that lay between DeSoto and the dream of his ambition, or the dangers that beset Coronado in his march of disappointment through undiscovered Kansas, to encounter, yet four hundred and fifty miles of an unknown river, guarded by a semi-barbarous people who have no particular good feeling towards a frontiersman, lay between them and civilization, presented anything but a cheerful outlook for this pioneer voyage. The trip was made, however, without adventure and in a reasonable time. The produce dis-

685 posed of, the navigators returned overland to Arkansas City and reported a fair depth of water and a lively current from the State line to Fort Gibson.

On the strength of this report, a joint stock company was immediately organized, and an agent appointed to proceed at once to the Ohio River and purchase a suitable steamer to ply between the points named. A light draught wharf packet was procured, and a point known as Webber's Falls, between Little Rock and Fort Gibson, reached on her upward trip. Here it was found that her engines were of [unsufficient] power to stem the current, so she was taken back to Little Rock and there sold at a loss to her owners of twenty-five hundred dollars.

This failure temporarily dampened the ardor of even the enthusiastic commercial path-finders, and nothing further was attempted until the summer of 1878, when Messrs. W. H. Speer and Amos Walton, two leading public-spirited citizens of the county, equipped a "Ferry flat" with a 10 horse-power threshing machine engine, and by several trips up and down the river for a distance of 60 miles from Arkansas City, demonstrated beyond a doubt that a steamer could be successfully propelled on the Arkansas river at any season of the year. The flat was fifty feet long, sixteen feet wide, and drew ten inches of water. This novel little craft visited Grouse creek, the Walnut river, Salt City, the Kaw Indian Agency, Oxford, and other points along the river, and attracted crowds of people wherever it went. At Oxford a public reception was tendered its officers and crew. These experimental trips were all made while the river was at its lowest stage, and prior to the annual "June rise".

Soon after this, and while the "ferry flat" was still prominently before the public, Mr. I. H. Bonsall, an experienced engineer and prominent citizen of Arkansas City, corresponded with the business men of Little Rock, and induced them to send a boat on a trial trip to the upper country. The

little steamer "Aunt Sally" (see engraving), a tug built for the deep, sluggish bayous of Arkansas, and used in the local cotton trade there, was selected and manned for the purpose. Though not designed for swift water, this crude little steamer made the complete voyage, and, in command of captains Lewis and Baker, with Mr. Chapman as pilot, landed safely at Arkansas City, and was [mored] there, in the Walnut river, Sunday morning, June 30th, 1878. The officers reported sufficient water and a safe current for light draught steamers for the entire distance, and expressed themselves of the opinion that a boat built especially for the purpose could run regularly between the two states every day in the year.

Soon [after] the "Aunt Sally" returned South, Henry and Albert Pruden and O. J. Palmer, of Salt City, Sumner County, started for Little Rock with a "ferry flat" loaded with seven hundred bushels of wheat. The wheat was sold at a good round figure, and the gentlemen returned, reporting a successful trip and a good stage of water.

On their return, the business men of Arkansas City, finding that steamboat owners in the lower country were not disposed to adventure up so far with their boats, resolved to build a steamer themselves, and with it make regular trips between their city and the Indian agencies at the Territory. After several attempts to find men of experience to take the matter in charge, McCloskey Seymore secured the services of Mr. Cyrus Wilson, who began the building of a boat for the purposes named. Wednesday afternoon, November 6, 1878, the "Cherokee", the first steamboat ever built in Kansas, was successfully launched at Arkansas City.

The hull of this boat is 83 feet long, 16 feet wide on the bottom and 85 feet long and 18 feet wide on the boiler deck; beam, 22 feet, with guards extending 2 feet around a model bow. She carries two twenty-horse power engines, and with all her machinery, draws less than eight inches of water, and, when loaded to the guards, will not draw over sixteen inches. The shallowest water found on the bars between Wichita and Little Rock during the lowest stage of the river was eighteen inches. From this it will be seen that the "Cherokee" will answer the purposes for which it was built, and be of great service in transporting the supplies from these counties to the Indian Agencies lying south and east of Arkansas City.

With the Arkansas River opened for navigation, and a good line of boats and barges making regular trips between the points named in this article, business of all kinds will receive a fresh impetus in Southern Kansas. There will be no railroad monopolies, no "pooling of earnings" and no forming of combinations to affect the interest of the producers. The farmers of this remote locality will then have a highway of their own by which they can exchange their surplus wheat, flour and corn for the coal and lumber of the lower Arkansas. The advantages of this proposed line of commerce are apparent, and need not be repeated here. The attention of Congress has been called to them and we patiently await the official report of its Commission on the subject of navigating the Upper Arkansas River."

It was stipulated and agreed that the Arkansas River throughout its course in the State of Oklahoma was measured by the surveyors of the Land Department of the United States in the survey of 1871-1872 and that the testimony in the case of State of Oklahoma vs. Larry Nolegs and others from which testimony has been read, was given in the State District Court of Pawnee County, Oklahoma, between the dates of February 5, 1912, and February 10, 1912, or thereabouts, and that the testimony of the witnesses named here as read in this hearing was the testimony given at that time and is a part of that record, given at the trial of the case of State of Oklahoma vs. Nolegs, et al., in the state court and by agreement given in this case as depositions of said witnesses.

Defendants here offer the testimony of the witness, J. A. Paff, in the Nolegs case, as follows:

688 Here defendant offered in evidence testimony of J. A. Poff, as contained in the Nolegs record:

Direct Examination.

J. A. Poff, 51, resident of Cleveland, Oklahoma since 1904, city marshal at Cleveland for 2 years, now traveling salesman, knows and lived for 3 years about 5 or 6 miles from island in controversy.

In 1882 or 1883, while going through from Kansas to Texas before country was opened up, stopped near said island for 3 or 4 weeks on north or Osage side of river on account of high water. Men by the names of Green, Ferguson, W. T. Lawson and Bud Dicker and others formed the party of eight. While

waiting, said party hunted most of the time and they were camped in about the down stream end or south end of the island. The island seemed to split the river near the middle. It would have been hard to tell which was the deepest side of the river; when they forded the river with teams, the deepest, swiftest water was on the north or Osage side. They tried 3 or 4 different times to cross; the river was probably 5 or 6 feet up at that time. Witness partially observed the banks of river on north side at that time; had seen the banks several times since; the last time was Thanksgiving Day; he could not say that he noticed any appreciable change in the banks of the river on Thanksgiving Day and when he first saw it in 1882. The island had taken up considerable since he first saw it, there being considerable more timber. The river looked to be the same as to width when he saw it last as it did the first time he saw it, the height of the banks being practically the same. Witness had been on the island several times and had been there when the water was high. Witness can't remember the year when he was on the island, but thinks it was when Walt Lacey and his father were both living on the farm. He went hunting and
689 over in the hills a bunch of turkeys jumped up and they went through over to the island in a boat that they had obtained on Bear Creek. They went into the timber on the island and the water was pretty nearly over the island. Witness did not think there was a house there then. Had been there several times since and they didn't get out of the boat. Could not say how much water there was, but thought it covered the biggest portion of the island. Witness went there about dusk and it was a risky piece of business on account of the river being so swift. Witness had seen the time when if the water had risen a foot higher than it was, it would have covered the island. At any time there is a rise, the water seems to split the island in the middle as a general thing.

Cross-Examination.

The ford where they crossed was considerably below the island. Witness did not cross the river above the island and could not answer as to whether or not the deepest part of the channel above the island was on the Pawnee County side of the river.

Witness supposed you may go up the river a mile or so, probably up opposite the mouth of Mud Creek, and you would find the channel flowing in up there.

Witness went out on the Pawnee side of the river. The fact that he found deeper water on the north side showed that it was the swiftest water on that side of the river.

Witness never forded the river or took any soundings at the island. The river was very high; in fact, it was 4 or 5 feet high when they went there. It began to fall a day or so after they landed.

The river crossing runs straighter now than it did then and the road ran out closer to Bear Creek than it does now, Bear Creek being down stream east of that crossing. Witness supposed Bear Creek is between a half mile and a mile from the island, taking the extreme end of it. In 1883, they struck Bear Creek and followed out up it. On that trip witness started from Montgomery County, Kansas, Denison, Texas, being then his home town. Witness was then peddling Rumsey pumps and lightning rods. They crossed into the Osage Indian country right south of Coffeyville. Witness does not know the location of Bartlesville, having not been there since it started. They found soldiers there who put them out of the Osage a couple of times. The men with him on this trip were men he had hired,—one being Charlie Ferguson, supposed to be dead, another being W. T. Lawson at Greenfield, Tennessee, another being Bud Dicker at Dallas, Texas, another being Jim McFall, living at Memphis. He was working for American Lightning Rod, Coulter Brothers, Greencastle, Indiana, St. Louis, Missouri later on. Does not remember to whom he sold any lightning rods. Does not know that President Cleveland was the first President to send any soldiers into the Osage. United States soldiers, or Indian police, belonging in the Osage country, three in number, wearing blue uniforms, escorted him out of the Osage either in December or January, 1882 or 1883. Could not state positively the date they hit the river. Thought it was in the first of the year, the party landing in Texas in March, taking in pretty nearly all of the Choctaw and Chickasaw country. Did not stop with any Indians on the Osage Reservation. Thought at that time an Indian might accidentally scalp a fellow. There were no trails through the Cherokee country and they were not well enough acquainted as to just where they ought to hit the country. They started to go to Pawhuska, the party thinking there were some buildings there; then they had to turn back, being put back over the line.

691 Witness had never been on the island when the river was at its highest, but had been there when it was up considerable. Witness did not know what would be consid-

ered an extraordinary rise, but he had seen several rises that pretty nearly covered the island. There was generally a turkey roost on the island; a bunch of turkeys on the south side, being jumped, would go to the island. The hill road is perhaps three-fourths of a mile distant from the island. Witness never took any particular notice of the width of the channel on both sides of the island.

Arrived at Okmulgee some time in January, 1883, putting up just east of the old Indian Capital Building. There was not much of a town at Okmulgee then and witness didn't know who he saw at Okmulgee then, outside of his party.

Redirect Examination.

When witness was interviewed about a year prior to the date of giving his testimony, he went back over some old papers to locate the date that he crossed the river. Witness kept a register of his notes and also having receipts. Witness went to his records and looked up a shipment of material that had been shipped to him at Independence. Witness determined from data of the events that happened during that trip that it was somewhere the latter part of December or along the first of January.

692 P. D. WYNN, testified as a witness on behalf of the defendants:

Direct Examination

By Mr. Freeling:

Witness states that he is employed in the oil field, and that he has lived in the vicinity of Osage for the past nine years. He states that he has been on the river in the vicinity of Turkey Island, and that during the past year he has worked right on the north side of the island on the Pawnee Osage Oil Lease in the [empty] of Judge Armstrong. Witness states that he has observed the different rises in the river during the past year and that high rises have occurred five times. The highest water, he states, occurred about May 26th and while he does not know how many feet this rise was, it was practically over everything in the neighborhood of Turkey Island. He states that pretty nearly all the island was under water, just a little point being out of water. This point, witness states, was [bout] the middle of the island on the north side and consisted of about an acre and one-half or two acres. Referring to the map marked exhibit 10, and to the point marked "well," witness states at the time that point was under water. Witness indicates the part of the island between the Quapaw

Pipe Line Company and the section line as being the only part of the island out of water. He states that during ordinary rise in the river the island overflows but that in small rises it does not overflow. He states that on the 26th of May, when he observed the usual high water, the bank of the north bank of the north channel was pretty well under water. At one or two places, he states, it was over the bank, where the two or three little shanties are. These places where the water broke through, witness states, were low places in the bank. Witness states that he knows a man by the name of Sharp who lives on Turkey Island, and that Sharp had to get
693 out because the water got pretty high on the island.

Witness states that he saw his house afterwards and that the water had been up to the house but he could not tell whether the water had been in it or not. Witness states that he could see a part of the island, consisting of an acre and a half, that was protruding above the water.

Cross-Examination

By Mr. Taylor:

Witness states that right close to the railroad track there were two little [buildings], one an office building and one a little house, and that the water was just below the shanty or dwelling house. He states that it would take two or three feet rises to put the water over the railroad track by the shanty. Witness states that the tool house is on a little raised ground practically as high as the railroad track itself, and that the water was almost up to the tool house. He states, also, that the water during that rise broke over in low places and backed around the M. K. & T. railroad tracks to the north. Witness states that there was a field between the water that backed in north of the railroad track and the river and that the water went over this field in the low places and also broke over the track. He states he did not notice how much of the territory back of the railroad was covered, though he knew where the water was as he was there every day. Witness states that he did not notice that part of the Thomas farm was under water during the same rise. The reason he noticed the island particularly was because he was working in the river bed on the north side of the island and he never paid any attention to the height of the water on the Thomas or Thompson farm. He states that [shile] he does not know whether the farms on the south shore south of the island were covered that about the point where the railroad line strikes the range lines the water was nearly up to the
694 tool house, which is close to, and practically as high as the railroad track. Witness states that he would call

an ordinary rise of the river one of three or four feet and that that would cover parts of the island covered with trees and grass, as shown on the plat. Witness states that while he is not sure about it, his belief is that the slough on the island is not three or four feet higher than ordinary low water mark and that a three or four foot rise would go through the slough. He states that he has noticed in slight rises the water would be up to the edge of the island. Witness states that he does not know the dates of the lightest rises but there was a pretty fair rise on April 28th. He also states that the five rises referred to by him were pretty good rises. He also states that he does not remember any three or four foot rises during the past year.

By Mr. Freeling:

Witness states that the places on the north bank where the water broke through are lower than the other parts of the bank along there. He states that he has walked along the bank and the water was knee deep in places where it broke through, but not over the bank in general.

By Mr. Taylor:

Witness states that the low land north of the railroad track was in cultivation, and that that field was covered with water.

A. J. SHARP, testified as a witness on behalf of defendants on direct examination by Mr. Freeling, as follows:

Witness states that he is fifty-nine years of age, and that he has lived on Turkey Island since October of last year. He states that he is pretty well acquainted with the Arkansas River at that point. He states that he was originally
695 from Vermont and that he first became acquainted with the Arkansas river in '87 and '88 when he came there to hunt and fish. Witness states that he first saw the river near the island somewhere but he could not tell exactly, as there was no railroad then, and the north and south channels were practically dry, there being no running water—only a few water holes standing. He states that the condition of the river then was about the same as it is now. Witness states at that time the river was flowing through the north channel but not through the south channel. In the south channel, witness states, there were some towheads—little islands, grown up and bunches of cottonwoods and willows on them. There was no vegetation in the south channel to speak of. Witness states that since October, 1914, he has lived on the island on part of the Thompson claim eight or nine hundred

feet from the pipe line. Referring to the [mpa], Exhibit 10, and to the point thereon marked "house", east of the section line, witness states that he guesses that is where he lived. This house, he states, is something like two or three hundred feet from the section line and about two hundred feet from the south bank of the north channel. Witness states that the river at that point he supposes is eight or nine hundred feet wide. He also states that he is familiar with the point marked "well" on the north side. Witness states that he has noticed a number of rises in the river during the past year and that the river has been up generally in the year 1915. The highest rise, he states, occurred in the latter part of May. He states that on several occasions during the summer he moved out on account of the high water. The first time the water got up into his house. The other times he moved out because he thought it better to be safe than sorry. The first time he moved out, witness states, he went over to O'Connell's tool house. One tool house being on the first bank of the river, and another up on the second bank where small tools are kept.

Witness states that he left his place about two o'clock 696 in the afternoon and went across in a skiff and spent the night in the little house on the second bank. Witness states that his house stands about a foot from the ground and when he left it the water was up to the door sill. Upon his return he found that the river had left about six inches of silt which he had to take out. He states that the water was a foot over the ground and that if he stepped out of the house he would step into a foot of water. He states that he was away about a week but would come over to the island every day to look around but he did not go to the house. Witness states that his house is on a high place on the island, that the highest place on the island is between the section line and the pipe line. He states that a little bit of this high part of the island was not covered by water at the time he refers to. This uncovered space amounted to about an acre and a half. He states that at the time he moved over to O'Connell's house the water did not come up into the house but came within a foot from the floor. This house, witness states, is built higher behind [that] it is in front, and he tied his boat right to the corner of the house. He states that where the section line crosses the railroad track on the north shore line the water cut through and crossed the railroad track and went down the north side at the foot of the bluff. He states that the swale, or low place, where the water cut through is a little over a quarter of a mile from the section line. He states that the other place that the water [go]

through was down the river about the same distance, at which point a creek comes in and there is a little place where the creek has washed out and backed in. Witness states that those are the only places that he observed on that shore line where the water went through. He states that at the time the water broke through the north bank only the portion of the island mentioned by him was out of water. This he observed when he went across the island in his boat. He states that the water was over the north bank of the island the entire length of the island except the place mentioned.

697 Witness states that he has done work on the wells in the north channel during the last spring but not during the past summer, and while digging a well on the first bank just above the pipe line he dug up the jaw-bone of a horse. Witness states, the bank that comes up where O'Connell's tool houses are is higher than the island and at that point there are two banks, the first of which is low—a kind of step, seven or eight feet from the railroad track. Witness states, on the 26th of May, or the latter part of May, the water was up in the well down in the river bed but did not get into O'Connell's house.

Cross-Examination

By Mr. Taylor:

Witness states he crossed the river during the high rise in a skiff and that he went entirely over the Pawnee county side until he hit firm land. At the time, witness states, he was taking a man across and in order to strike the shore and get a footing on the south he had to go clear to the hills. He states that after he reached the ordinary shore of the river south of the island he had to go from third to a half a mile more before he struck land. Witness states that he went right across Thomas' land, cornfield and over the fence with his boat. He states that the water was up in Thomas' Orchard but that the orchard was on a higher piece of ground. He states that he could navigate a boat from the bluff of the north side of the river by the railroad track clear over to the bluff on the south main land. Witness states that there was a point on the railroad track where there was eighteen inches of water, and over which he ran his boat. He states that the corn field on Thomas' land, which he went over in his boat, fence and all, was a farm that is in cultivation every year; also that the land north of the M. K. & T. railroad track that was under water is land that was in cultivation. Witness states that the water that came in north of the railroad track was water that

backs up from the river in a creek. He states, at the time
698 Thomas' corn field was covered, and the other localities were in the condition he described the island was not entirely submerged, the little place that he mentioned being uncovered; also that the rise in the river that he speaks of is the largest one that he has ever noticed. Witness states that the tool house he has been speaking of [it] about thirty feet from the railroad track, and very near on a level with it so that the water that would get up in the floor of the tool house would come very near going over the railroad track at that point on the section line. He states that ten inches or a foot more would have gone over the track at that point. Witness states that there are two hundred acres of island covered with vegetation, trees and grass. He also states that the rises which occurred during the past year were unusual and that he had never seen anything like them before on the river. Witness states that he knows Mr. Behning, the surveyor, and that he accompanied him to a point on the island where he took down the Government meander stakes. He states that on the north side of the island Mr. Behning found the stake he was digging for and that it was covered over about twenty-seven inches. On the south side, the stake was covered about two feet. [On the south side, the stake was covered about two feet.] He states that the surveyor found the two iron stakes that he was looking for on the range line. He states that he did not know of any one digging on the island for the purpose of finding these stakes other than Mr. Behning, and that he accompanied Mr. Behning on the 24th of December last.

W. C. BURK, testified on behalf of the defendants.

Direct Examination.

Witness states that he has lived at Oklahoma City twelve years; that he is a civil engineer and contract. He states that he is fifty-nine years of age, and that his preliminary training in civil engineering consisted of a year's field work before he went to college, after which he took a two year and one-half
699 course in the State University of Kansas, since which time he has been in the active practice of his profession. When he left college, witness states, he was instrument man on a survey, following which he worked for four years for the central branch of the Union Pacific railroad. Starting in as instrument man, the last year he was assistant chief engineer of the road, in charge of all construction. He states that during the four years they built four hundred miles of railroad. This railroad ran through the

northern tier of counties in Kansas. He states that he left the Union Pacific railroad in 1880 and went with the M. K. & T in Texas. He quit this latter road as assistant chief engineer. Witness states that he built the M. K. & T. from Fort Worth to Tyler, one hundred and fifty five miles, and finished that in 1882, and he was about eight months with the Cotton Belt putting up the Red River Bridge, across the Red river down near Texarkana. After that he went in the operating department of the Santa Fe in New Mexico; stayed with them about a year. Later he worked with the Southern Kansas Company at Chanute, building what is known as the Chanute and Carey branch of the railroad—Santa Fe. Following that he was with the Fort Scott and Memphis building what was known as the Kansas City, Clinton and Springfield road as assistant chief engineer. Following that he was with the Union Pacific, locating, engineering and constructing. He built a line for them from Denver to Marshall, called the Denver, Marshall and Boulder road. And following that in eighty six he was appointed assistant chief engineer of the Gulf, Colorado and Santa Fe and built the line from Fort Worth to Purcell, Oklahoma. And then for a period of about ten years he quit railroading and went into the practice and irrigation—he followed irrigation in Colorado for about ten years. During that time he was chief engineer of the Rocky Ford Highland Ditch and he was consulting engineer for the Great Plains Water Company. During the interval, part of

700 the time he was contracting and part of the time engineering. Witness states when he left there he went to

Arkansas to build the Eureka Springs road, as contractor. Then he went to work for the Santa Fe again and located the Eastern Oklahoma branch of the Santa Fe from the Arkansas river to Shawnee. That was in 1901. In 1902 he was with the M. K. & T. and had charge of the construction of their line into Oklahoma City. He states that he left the M. K. & T. in 1904 and was appointed city engineer of Oklahoma City, which position he held until 1911. Since 1911, witness states that he followed the profession of contracting engineering. He states that the last time he was with the M. K. & T. he held the position of division engineer in charge of the line from Oklahoma City to the Arkansas river, including the Guthrie branch, and that he supervised the construction of the Guthrie branch. During his connection with the M. K. & T. he states that he had in charge, and finished, the line from Bartlesville to Oklahoma City, including the Guthrie branch. Witness states that he has seen the island in controversy in

this litigation known as Turkey Island. He states that the final completion of the M. K. & T. road just north of the river, was built under his supervision and is what is known as the Wybar branch. He states that he has been along this road by Turkey Island and that this particular branch was completed in 1904. Witness states he has been in the vicinity of the island recently to take some elevations around the vicinity of the range line on the island. These elevations were taken at the request of Mr. Freeling and Mr. Ledbetter and for the purpose of familiarizing himself preparatory to testifying as to the facts. Referring to Mr. Behning's plat, Exhibit 10, and to the section line north and south through the island, witness states that he traced this line and took the elevations. Witness states that the highest point on the island is near the little new cabin west of the range line, an oblong shape extending east and west. He states that he made a profile of the range line from bank to bank, Exhibit "F", which represents the elevations along the range line running north and south through the island, the left side of the map representing the north side beginning at the M. K. & T. railroad at the top of the rail on the section line. Witness states that he used for his base an assumed elevation of one hundred for the top of the south rail at the extreme left hand end of the island running through the blue print. He states that the rail is about four or four and one-half inches high, and the top of the tie is practically on the elevation of the natural ground. Witness states that he went about seventy-five feet south before striking the bank of the stream, the first abrupt break. Assuming one hundred feet for the top of the rail at the extreme lefthand end, he states the top of the bank is seventy five feet from the south rail, and that the elevation is ninety nine three or seven tenths below the top rail, or the north bank of the stream. The next break, he states, is one hundred and ninety-five feet from the south rail of the railroad, the elevation being ninety one one. The next reading is at Station Two, two hundred feet from the south rail, the elevation eighty nine seven. The next reading is at Station Three, three hundred feet from the south rail, elevation ninety three one, and runs up to the point where the meander post is located, the ground there being ninety three seven but the top of the stob of the meander stake is ninety two seventy two. The next reading of the plat, witness states, is at Station Four elevation eighty-three eight on the north side of the main channel. At four hundred and fifty feet from the south rail is the edge or surface of the water, the elevation being eighty one three. Going off to the

right to the next angle, which is abrupt, the elevation is the same. The next elevation, witness states, is the meander post on the north line of the island. He states that he assumed that as zero for measurement purposes because they did not take any soundings as to the depth of the river, [the] just used the surface of the water. The elevation at the first point on the river, the north bank of the island on the south side of the north channel at the meander post, is ninety-five eight.

He states that the difference between the elevation of 702 the last point between the north bank proper and the meander post at Station Two, and the low point between the meander post and the railroad seventy-five feet south of the railroad is a drop of nine sixty. Beginning at the top of the south bank of the north channel on the island, being the north bank of the island, and going to the right on the south where there is a little elevation, he states, that they carried their measurement from that stake and took a reading every fifty feet using the measure based as zero on the north line of the island, and running south fifty feet plus fifty is an elevation of ninety-six two. Station One, which means one hundred feet, is ninety-four nine; one plus fifty is ninety-four seven; Station Two is ninety-one nine; two plus fifty is ninety-two five; Station Three is Ninety-one five; three plus fifty is ninety-one three; Station Four is eighty nine eight; four plus fifty is ninety-two one, and plus eighty is eighty-nine two; Station Five is ninety-two one, and plus fifty is ninety-four eight; plus sixty-six being the meander post on the south line of the island. The water elevation, witness states, is eighty and nine-tenths. Now, at six plus fifty is eighty-seven three, and six plus sixty-six is eighty-two seven. Station seven is eighty-six four; seven plus fifty is eighty one nine. Station six is eighty-six four; Station Eight, I mean; Station Eight plus fifty is eighty-seven seven; Station nine is eighty-four seven; nine plus fifty is eighty four six; Station Ten is eighty-four five; ten plus fifty is eighty-four six; Station Eleven is eighty four one; eleven plus fifty is eighty two one; Station Twelve is eighty one nine; twelve plus thirty is eighty-two eight; twelve plus fifty is eighty nine seven; twelve plus seventy-three is ninety-four four. The top of the stake—of the meander corner stake is ninety five seventeen. We took a reading on top of the stake. It extends up about—a little over a foot and the ground at that point is ninety four four; the top of the stake is ninety five seventeen. At thirteen plus ten it is eighty-nine three; the top of the main bank on the south side is ninety-six six. That is the end of the profile; thirteen

plus fifty, or the south bank of the south channel. Witness states that after leaving the deepest part of the north channel going across the island the first deep place represents a slough with dead and not running water in it. Referring to Mr. Behning's map, witness states that the slough referred to would be right in between the little island the meander post. The wavy line at the upper right hand corner of the blue print, he states, represents a profile of the ground starting at the meander post at the range line on the north edge of the island and running in a Westerly on a course varying north sixty-seven degrees and forty minutes west, running in the direction of the new cabin on the high point of the island. Referring to the Behning map, witness states that the course he ran was from the meander post on the north bank of the island on a line in the direction of the new cabin, the cabin being four hundred and twenty feet west of the range line; continuing they went across the pipe line the full length of the high ground. Witness states the reason the line was running that way was because it was the highest point on the island he wanted to get a profile of that point. Beginning at the left hand corner of the line showing the elevation, witness states that zero equals the meander post on the range line on the north side of the island; elevation of the ground ninety-five eight, then plus fifty is ninety-five nine; station one is ninety-five eight; one plus fifty is ninety-five six; station Two is ninety-four five; two plus fifty is ninety-three six; Station Three is ninety three three; plus fifty is ninety-four eight; plus eighty is ninety eight six; Station Four is ninety-eight nine; four plus fifty is ninety-nine; Station Five is ninety-eight seven; five plus fifty is one hundred and sixtenths; and plus seventy-five is ninety-seven two; Station Six is ninety-nine seven; six plus fifty is ninety-eight one; plus eighty five is one hundred and three tenths; Station Seven is ninety-seven four; seven plus fifteen is ninety-four three; seven plus fifty is ninety-eight six; Station Eight is ninety-eight five; eight plus fifty is ninety-eight three; eight plus seventy-five is ninety-three four; station Nine is ninety-five nine; and nine plus fifty is ninety four. Referring to the old elevation to the right of Station Seven, seven plus fifteen, which is ninety-four three, witness states that the distance from that point to the next highest point going east is thirty feet from the low point, and that the difference in elevation from that point to the next highest point to the east is six feet. This, he states, is caused by the sandy soil which washes and the small draws that cut across the inland.

He states that there are two draws right near the well and all over the island the ground is lower than it is right at the well—a couple of feet lower than it is on the range line. He states that the island through there is wavy and subject to depressions as sketched by him. Witness states that he has made a plat or drawing indicating the part of the island that is above high water on the profile and this is represented by the little drawing on the lower right hand corner marked "Sketch", and is explained by the witness as follows: "The high water mark, the elevation is ninety-eight six, we found by—we found the point on the edge of the island, edge of the high ground that would give us an elevation of ninety-eight six and after locating that by elevation we measured to our traverse line that we ran through; noted it in that manner. As for instance, at station four, which was the first station above the high water, it was forty feet from our line to the left to where an elevation of eight-six—eighty six was given and on the right it was four feet. Now, at four plus fifty on the left it was eighty feet out to the edge of the high ground and eight feet to the right. And at Station Five, it was one hundred and fifty feet to the left and seventeen feet to the right, and at five plus fifty it was one hundred and forty feet to the left and twenty eight feet to the right, and at Station Six it was one hundred and forty feet to the left and sixty feet to the right. And at Six plus fifty it was one hundred and fifty feet to the left and eighty five feet to the right; and at station seven 135 feet to the left and eighty to the right; at seven plus fifty it was 100 feet to the left and 95 to the right. At Station eight it was 75 feet to the left and 100 feet to the right. At eight plus fifty it was 50 feet to the left and 75 feet to the right and at station nine the high ground was all north or to the right of our line. We found the high water elevation struck the ground twelve feet to the right of station nine and the other side the high ground was sixty feet from that point, and at nine plus fifty the high ground played out."

In determining the high water point on the island, witness states, he first found the high water marks on the north bank of the river by taking the high water marks on the buildings and trees. The first high water mark, he states, was on the engine house located east of the range line at about Station Three of the profile, (exhibit F.) He states that when he refers to stations he means the figures on the base line below the profile itself, increasing in numbers as you go to the right. He states the line running south from the rail-

road, on the range line, and the first elevation was on the engine house about a hundred and fifty feet east of the range line, opposite station three. That elevation was ninety-eight six; that mark was a high water mark on the buildings. The next was on the old pumping station, fifty feet north of the range line opposite station three. That was an elevation of ninety-eight six. The next reading was at an old cotton wood stump, the top of the tree had bdown off and the break was so it left a trunk, white, clear and smooth in the break, no bark on it, and the water mark was very well defined, and that proved to be an elevation of ninety-eight six. The next was on a tool house, seventy-five feet west of the same point, on the range line; that elevation was ninety eight six. And on a large cottonwood three one hundred and fifty feet west of the Chos-Osage lease—[howe] do you pronounce that?—Choe-Osage lease, that is a hundred and fifty feet north of well number one that was ninety
706 eight six. Then another elevation—that was all the high water mark; that was the highest water mark. Now, in the same locality there was a second mark lower than that; a well defined mark on the buildings and all. That proved to be an elevation of ninety five eight. We took an elevation one hundred and twenty five feet west of the range line, opposite station three on the old tank house, and another one on the tool house. They were both very well defined. Now we carried that elevation across on to the island and checked it with the elevation of high water mark on the building at the well on the island. And the elevation there was four tenths different from the high water mark on the north side. Witness states that the profile shows the two high water marks that were found. He states that they found one and ninety-four hundredths acres of island above high water as shown by Exhibit "F". A portion of this acreage, witness states, is small sloughs that cut into it but did not deduct them. The rest of the island, he states was below the outer edge of the drawing—the high water line ninety-eight six. Witness states that he made another memorandum showing the elevation of the island at what he called "Jack's cabin" about three hundred feet east of the range line on the island. This cabin, he states, is on the high place of ground about fifty feet wide and one hundred feet long. The elevation at this point, witness states, was ninety-six six, two feet below the high water line. On the plowed ground to the right of the section line, witness states, that he walked over it, and that the high water mark in the trees showed from two to four feet above the plowed

ground. North of the plowed ground he states there is little ledge which might have been a levee about twelve feet wide and running three or four hundred feet in length. No elevation was taken of this because there was evidence of high water all over this ledge. Referring to the large plat made by Mr. Bening, and particularly to the part through which the north and south section lines run, where the bank on the north side appears to be, a stretch of timber, 707 witness states that he observed that. He also states that the character of the land, referring to Exhibit 10 between the north water line or the north bank as it appears on the north side of the stretch of timber is sandy deposit. As to the elevation, witness states that it is low; all the way from four to nine feet below the bank. Witness states that the elevation just to the left of the timber, of ninety-nine fifty-five as shown by the plat, is approximately correct. North of the timber he states that the elevation is ninety-eight eighty-five. On the pipe line north of the timber the elevation is one hundred and one one. On the section line north of the timber the elevation is ninety-eight fifty. Witness states that the bank of the river instead of going down, as shown on the plat, Exhibit 10, goes around the north edge of the timber with a well defined bank all around it. He also states that this bank is practically the same height as it is on the north bank of the stream as shown on the plat to the north and west of the timber and also to the east and south of it. He also states that the bank between the two points where the timber begins on the east and where it ends on the west as shown on the plat, drops down low, and the portion shown on the plat as timber on the north side of the stream is also down low. Witness states that the bank on the north side around the north edge of that timber, as stated by him, is from four to nine feet above the surface. At this point is where all the high water marks on the north side were gotten as shown on the trees and buildings. On the large cottonwood tree, one hundred and fifty feet north of well No. 1 on the Cho-Osage lease, the water mark was six feet above the ground. East of the section line the water mark was on the buildings from four to six feet. About one hundred and fifty feet west of the pipe line it had all been overflowed and showed water marks on the trees but he did not notice how high it was. Witness states that all of the north side, which is shown to be timber on the plat through which the pipe line on the section line runs, is

subject to overflow and acts of floods or high water and becomes submerged as much as from four to six and seven feet. Going over to the island beginning where the section line intersects the island on the north side, witness states that that is also subject to overflow, and that that point of the island is two feet and four-tenths below high water. Going south, he states, the ground falls and is irregular and wavy. On the south side of the island where the section line leaves it the elevation is ninety-three five, and this point also overflows, it being five feet and one-tenth below high water mark. Referring to the profile marked Exhibit "F", witness states that there are no points indicated thereon that are above high water mark and that he would say that the entire island is subject to overflow on that range line. He states that there is a small part of the island where the new house is west of the range line that is above high water line as shown by the profile on the outer right hand corner of Exhibit "F". He states there are three points on the range line between stations five and seven that are above high water mark. The first on the lefthand of the profile, witness states, is about twenty feet in diameter which stands one and seven tenths feet above high water line, the elevation being one hundred three. The second point which is just above station six is a little larger in area but not so high as the first, the elevation being ninety-nine seven that is, a foot and one tenth above high water, the area of this knoll, witness states, is possibly twenty feet wide and sixty to seventy feet long. The third knoll, just above and a little to the left of station seven is two feet above high water line, and its area is not over ten or fifteen feet square and looks like the wind blew it up, [through] it is the highest of the three. Witness states he observed the indication of the high water on the trees but that the elevation was taken on the buildings by the well west of the range line. He states that there was a well defined water mark along the line of the buildings and he took that elevation which was a foot and a half higher than the platform of the well.

709 He states that the entire island is subject to overflow except the three little points which he has described. but there is a small district west of the house which is right at high watermark. He states there might possibly be a third of it that would be above, and two thirds below high water—it is right at high water mark on the profile and surface of the ground and a line practically coincide as shown on the plat. Just above station eight, witness states, the conditions are the same. The surface line of the profile and the

elevation of round and high water mark practically coincide. This point, witness states, runs north and north in length and is about one hundred and seventy five feet in length and one hundred feet wide. The point which appears to be right along high water line at Station Five is one hundred and sixty-seven acres north and south, and at Station Five plus fifty it is one hundred and sixty eight across north and south, the highest elevation at this point being one hundred six. Practically speaking, witness states, from the figures he has given, if the river was running full in its banks, the entire island would be overflowed with the exception of the little high points. He states that when they arrived at the area of one acre and ninety four hundredths they took the extreme boundaries of the high ground and did not deduct the low places that cut across the high part. Witness states that where Exhibit 10 shows an elevation of ninety eight fifty at the north of the timber on the section line just below the starting point on the railroad he found the elevation to be ninety nine three. Exhibit 10 shows the elevation coming down just before crossing into the water where the meander stake is; to be ninety four thirty five, whereas he found it to be ninety three seven on the ground, the top of the meander stake, witness states, was ninety two seventy two. Going across the water the meander stake on the island, according to Exhibit 10, shows an elevation of ninety five forty. This witness, states, he found to be ninety five eighty on the surface of the ground, the elevation of the top of the stake being ninety seven sixty three, considered above the surface of the ground. The elevation at the south side of the island where the meander stake is before going into the south channel he found to be ninety three five, and the top of the stake ninety five forty one also above the ground. The elevation of the south bank of the south channel witness takes is ninety five seventeen on top of the stake, and on the surface ninety four four. He states that the bank at the edge of the stream as shown by Exhibit 10, on the south side of the south channel gets higher going south. The meander stake is at station thirteen plus seventy three at twelve plus seventy three, and at thirteen plus forty is the top of the bank in the field, the elevation being ninety six nine. As to the character of the bank up and down the south side of the river, witness states, there is a break in it at the range line. There is low ground between the bank of the river that the meander stake is on and the main bank. There is low ground and a kind of slough where the water evidently pass-

es through in a considerable volume, that breaks trough the natural bank and goes out into the field, from the indications of the water. With that exception, extending to the northwest and southeast, the higher bank down to the point where the timber ceases and is all defined as it is on the north side. Witness states that when the banks on the south side would be running full before it would break out of the main banks on the south the highest point on the range line of the island would be seven tenth under water. Witness states that the south bank is in the neighborhood of two feet lower than the north bank. He states that if the south bank were running full it would submerge all the island except that portion around the cabin west of the range line which at that elevation would increase the diameter of the island uncovered with water from one acre and ninety four hundredths to two acres and one half.

711

Cross-Examination

By Mr. Taylor:

Witness states that he made his investigations on Wednesday and Thursday of last week—1915, and that he does not know what the conditions were upon the island at the time the plat, Exhibit 10, was made. He states that he does not know whether the plat correctly represents the conditions at the time except that the measurements checked very close. Witness states that there is a difference in elevation between the meander lines on the north, the north bank next to the railroad on the range line, and a slight difference in some other elevations. He states that Exhibit 10 gives elevations on the range line at the meander points on the south and north edges of the island lower than those he found in his measurements so that exhibit 10 shows these two points on the island lower than at the present time. He states that he did not dig down to the Government's iron meander stakes either on the north or south edge of the island and for that reason he does not know whether Exhibit 10 is based upon the actual location of these iron stakes or not. Witness states that they took the wooden stakes, marking the places as the meander stakes, and did not dig in to find the Government's iron stakes at all, on the island. They did, however, on the north side of the north channel. Witness states the highest water mark was taken from the evidence of high water that they found on the river on trees and buildings. He states that he took the elevation of two different stages of water as indicated by two different markins on the buildings and trees. He states that he did not find any higher water mark anywhere than ninety

eight six, which he took as his basis, so that his plat is made from the extreme high water mark for the year, 1915, which he found surrounding the island. He states that his testimony as to Exhibit "F" is based on this high water mark. Witness states that he has not the least idea what the ordinary high water mark is. He states that the high water mark that he found and accepted as a basis for his computation is

712 just one foot and one-half lower than the top of the south rail of the M. K. & T. railroad on the section line. Witness states that as far as he can see the railroad is the same as it was when it was put in in 1904, and that he had charge of building the road and that so far as he knows it has not been necessary to make any change in the grade of the road owing to the prevalence from year to year of high water over the tracks. He states that the elevation of the cultivated land on the Thomas farm west of the range line and south of the river is ninety six nine. This elevation, he states, was taken out in the corn field and outside of the timber. Witness states that he did not take any elevations further than are shown on the profile, Exhibit "F". He states, however, that from observation the ground towards the foothills is lower than it is at the bank; in other words, there was low ground just above the point where he stopped. He states that he found high water marks on the trees on the Thomas farm a foot and seven tenths above the ground. Witness states that his high water elevation was ninety eight six, and the highest ground on the south bank was ninety six nine, a difference of a foot and seven tenths, so that the water was a foot and seven tenths above the highest ground he found on the south bank of the river at that point. Witness states that while the water broke through one place on the bank it was high enough to get entirely over all the bank without any reference to a break. He states that he did not take the elevations of the cultivated land marked on the Government's plat Exhibit 10—the west end of the plat on the south bank of the river. The reason he did not do this was because he did not have the time. He also states that he did not take elevations of the cultivated land by the railroad track north of the river but he walked over and rode over it making a careful examination. Witness states that he did not take the elevation of any cultivated land so as to show it on his plat on either bank of the river. His plat, he states, was made to show the high water mark and check up a profile across the river showing

713 how the highwater mark affected the island. He states that Exhibit "F" purports to show by the little diagram in the lower right hand corner the extent of the is-

land that was above the extreme high water mark for the year 1915 that he found. Witness states that the only high water marks that he found were the two that he has referred to, and he took as his basis the highest of these as indicated by the trees and buildings surrounding the island without any reference as to the time of high water. Referring to Exhibit "F" witness [state], that the squares represent twenty-five feet each, going east and west horizontally, being one hundred feet to the inch; vertically, he states each square represents one and a quarter foot. In making the profile, Exhibit "F" witness states they tried to get it as near as possible to the scale as was used on Exhibit 10. Starting his bench mark at one hundred, the top of the second bank is seven tenths below the bench mark or eighteen feet above the surface of the water in the north channel as he found it. The elevation of the bench mark or eighteen feet above the surface of the water in the north channel as he found it. The elevation of the ground he states was ninety nine three, and the elevation of the water eighty one three, making the top of the second bank eighteen feet above the surface of the water. The top of the first bank from the surface of the water he states is twelve feet and four inches. The meander corner on the north shore line above the surface of the water as noted on Exhibit "F" is fourteen feet and five tenths. The lowest point which he found on the island on the range line above the surface of the water in the north channel, witness states, is seven feet and nine tenths. This was in a slough or slight depression. The meander corner on the south side of the island he states was twelve feet and two tenths above the surface of the water as shown by Exhibit "F", and the meander corner on the south side of the river on the Pawnee county bank is thirteen and one tenth feet above the surface of the water as shown by Exhibit "F" so that it would take a rise in the river at that point upward of seven feet above the stage in which he found the river when he made his

714 investigation to have crossed any part of the island on the range as shown on his plat. Witness states that he has no knowledge of what the ordinary high water mark on the river is as he has never made any computation to ascertain that mark, nor was he instructed to do so. He states that he did not ascertain how much cultivated land on both sides of the river in the immediate neighborhood of the island would be overflowed with the river at the mark of ninety eight six, which he accepted as his basis, nor does he mean to indicate by any of the testimony given by him, or by the plat that the little diagram in the lower lefthand corner indicates

or has anything to do with the line of vegetation upon the island. Witness states that he found the island covered with large trees but he did not ascertain from his observation at the time whether or not the high water at the stage of ninety eight six extended over the bluff across the bottom land on the Thomas farm at the south bank. He noticed, however, that there was low ground between the main bank and the bluffs. Witness states that the water which went as high above the high point on the south bank possibly would go over and cover the bottom land in cultivation on the south side of the river. He did not, however, have time to go over in the fields.

HOMER J. WILKINS, testified as a witness on behalf of the defendants on direct examination by Mr. Burwell, as follows:

Witness states that his occupation is that of a civil engineer and that he has resided in Oklahoma City for about eight years, engaged in his professions. That he is thirty-two years of age and has been a civil engineer for ten years. Witness states that he was with Mr. Burk on December 22 and 23 1915, when he examined the island and made his observations with reference to the altitude and surroundings.

715 It was then agreed by and between the attorneys for the respective parties with consent of the court that this witness will testify to the same facts testified to by witness Burk, and the court shall so consider his testimony and outside of the qualifications of the witness Burke, the testimony of Burke shall be considered and treated by the court as the testimony of this witness.

716 Defendants offered in evidence lease from the State of Oklahoma to the Jim Crow Oil Company for island in controversy, also lease from the Commissioners of the Land Office to Brewer-Elliott Oil and Gas Company, also two leases from the Commissioners of the Land Office to the Number One Oil Company and assignment of part of said leases from the Number One Oil Company to the Arkansas River Bed Oil and Gas Company. Said leases and assignment are as follows:

717 The lease to the Jim Crow Oil Company was dated on the 7th day of January, 1917 and executed by the Commissioners of the Land Office, whereby the said Commissioners of the Land Office leased for oil and gas purposes to the

said Jim Crow Oil Company the right to prospect for oil and gas and the right to extract, develop, pipe and store oil and gas from the following described premises, to-wit: That certain island lying partly in section 25, township 21 N., range 8 E. I. M. and partly in section 30, township 21 N., range 9 E. I. M., containing 84.87 acres more or less, situated midway between the boundaries of Osage County and Pawnee County in the State of Oklahoma, and in consideration of said lease and the rights therein conferred, the Jim Crow Oil Company agreed to pay the State of Oklahoma a royalty of one eighth of all oil and gas produced and saved therefrom. Said lease contained the right of renewal and contained a provision that it should date from and after the time when the State of Oklahoma delivered peaceable and undisturbed possession to said lessee.

The lease to the Brewer-Elliott Oil and Gas Company was also executed by the Commissioners of the Land Office and dated on the 14th day of October, 1913 and gave to the said Brewer-Elliott Oil and Gas Company the right to exploit the premises therein described for oil and gas purposes and to remove such oil and natural gas from said premises, and covered the following described premises, to-wit: That portion of the bed of the Arkansas River below the high water mark except Turkey Island beginning at the point where the section line between sections 25 and 26, township 21 N., range 8 E. I. M., if projected, would cross said river, thence
 718 down said stream to where the same would cross the section line, if projected, between sections 30 and 31, township 21 N., range 9 E. I. M., and in consideration of the rights conferred upon the said Brewer-Elliott Oil and Gas Company by said lease, the said company agreed to pay to the State of Oklahoma a royalty of 12½% of all oil and gas produced from said premises, together with a certain bonus in oil.

719 The first lease to the Number One Oil Company was dated October 1, 1913 and gave to said Number One Oil Company right to exploit the premises therein described for oil and gas purposes and to remove such oil and gas from said premises, and covered the following premises, to-wit: That portion of the bed of the Arkansas River below high water mark in sections 1 and 12 and 13, township 21 N., range 7 E. I. M.

The second lease to the Number One Oil Company was dated October 1, 1913 and gave to said Number One Oil Company right to exploit the premises therein described for oil and gas purposes and to remove such oil and gas from said premises, and covered the following premises, to-wit: All that portion of the bed of the Arkansas River below high water mark in section 6 and 7, township 21 N., range 8 E. I. M. in Osage and Pawnee Counties, Oklahoma.

Said assignment from the Number One Oil Company to the Arkansas River Bed Oil and Gas Company was dated October 31, 1913, and for certain consideration therein named transferred to said Arkansas River Bed Oil and Gas Company the rights of said Number One Oil Company under its oil and gas leases from the Commissioners of the Land Office upon the following described tracts of land situated in the State of Oklahoma;

Tract No. 1—All that portion of the bed of the Arkansas River below high water mark in Sections One (1), Twelve (12), and Thirteen (13), Township Twenty-one (21) North, Range Seven (7) East, on the line between Pawnee and Osage Counties, Oklahoma, being about two miles in length.

Tract No. 2—The South half of the Northeast Quarter of Section Twenty-Five (25), Township Twenty (20), North, Range Twelve (12) East, Tulsa County, Oklahoma, containing Eighty (80) acres of land. This lease is a straight one-eighth ($\frac{1}{8}$) royalty lease. A cash bonus of Ten Dollars (\$10.00) an acre having been paid, the lease is assigned with the burden of Fifteen Dollars (\$15.00) per acre to be paid from oil produced upon these premises, and to be paid only in case oil is produced thereon in paying quantities, and for the purposes of this contract said oil bonus would be charged against both the first and second party the same as an item of cost of drilling wells and producing oil.

720 Tract No. 3—Being One Hundred and Seventy (170) acres in Township Twenty-five (25) North, Range Sixteen (16) East, Nowata County, Oklahoma, being the East half of the Northeast quarter of Section Seven (7), containing Eighty (80) acres; also the Northwest quarter of the Southwest quarter, and the Southwest quarter of the Northwest quarter, and the Southwest quarter of the Northwest quarter of the Northwest quarter of Section Eight (8); * * * * *

721 Defendants here introduce in evidence Senate joint resolution No. 19, approved January 18th, 1908, passed by both houses of the Legislature of the State of Oklahoma. Said resolution refers to the Arkansas River as "one of the great national highways prepared by nature for the internal commerce of the United States. Said resolution asked the Congress of the United States to make appropriation for the development and navigation of the said Arkansas River.

Here the State of Oklahoma and its lessees rest their case.

The defendant, W. H. Edminston, offered in evidence the testimony of H. A. Thomas, found on page 1046 of the Nolegs record, reading:

722 H. A. THOMAS, one of the defendants, testified as follows:

I reside on Section 25, Township 21, Range 8 East, about five miles southeast of Cleveland in Pawnee County, Oklahoma; have lived there since October 8, 1893, when I took my homestead claim there at the opening of the Cherokee Strip; the land in dispute is a part of that described in my Patent from the Government, which is as follows:

"2843

4-404

4076

Homestead Certificate N. 4076

Application 3841

The United States of America: To All To [Whome] These Presents Shall Come,—Greeting:

Whereas There has been deposited in the General Land Office of the United States a Certificate of the Register of the Land Office at Perry, Oklahoma, whereby it appears that, pursuant to the Act of Congress approved 20th May, 1862, "To Secure Homesteads To Actual Settlers on the Public Domain," and the acts supplemental thereto, the claim of Huston A. Thomas has been established and duly [consummated], in conformity to law, for the Lots numbered one, two, and three and the South West quarter of the North West quarter of Section twenty-five and the Lot numbered two of Section twenty six in Township twenty-one, North of Range eight East of Indian Meridian in Oklahoma, containing one hundred and [forth-three] acres and fifty hundredths of an acre according to the Official Plat of the survey of the said land, returned to the General Land Office by the Surveyor General;

Now Know Ye, That there is, therefore, granted by the United States unto the said Huston A. Thomas the tract of Land above described; To Have And To Hold the said tract of Land, with the appurtenances thereof, unto the said Huston A. Thomas and to his heirs and assigns forever.

In Testimony Whereof I, Theodore Roosevelt, President of the United States of America, have caused these letters to be made Patent, and the seal of the General Land Office to be hereunto affixed.

Given under my hand, at the City of Washington, the seventeenth day of April, in the year of our Lord one thousand nine hundred and three, and of the Independence of the United States the one hundred and twenty-seventh.

(Seal)

By the President: T. ROOSEVELT,
By F. M. McKean, Secretary.

C. H. BRUSH,
Recorder of the General Land Office.

Recorded Oklahoma
Volume 94, Page 53.

723 Endorsements: 13650 Oklahoma Territory, Pawnee
Co: Filed in this office at 8:30 o'clock A. M. Jan 20
1904 and recorded in book one Patents page 355.

(Seal)

T. M. BROADUS,
Reg. of Deeds.
By F. H. Holliday, Deputy."

Pd. 1.00

I first became acquainted with the land in controversy in this law suit on the 8th of October 1893; with reference to claiming the same I have kept stock on it through the winter especially; I have cut the timber off of it when I needed it; hauled wood every year, I reckon, and used it just the same as I used every other part of the farm as I needed it every year since 1893. I held possession of the land and used it as I have stated; I was instructed my filings included all of the north half of section 25 and I never had a claimant notify me he had ever claimed any part of it; the possession I had of the land in controversy was held by me under claim of title to it; said land included that portion of the island north of Lots 1, 2, 3 and 4 lying in the north half of section 25 and includes all west of the range line.

I remember the circumstance of a man by the name of Flight being on the island, I do not know just how he got there but we found him on section 30 in range 9, that is east of the range line between ranges 8 and 9; that was some four or five years ago.

One of the neighbors caught a young man that lived with Flight stealing corn in our field and we knew the reputation of Mr. Flight and we went to him and found him in the field before he got the sack of corn; we had been missing corn continuously; we told him we positively would have no such going on there any more; if he wanted to hunt or fish and not cut timber nor steal and wanted to use the house and farm

724 for a living on that island, we wouldn't bother, but that if we had any more stealing or missed any more property he would have to go; he was on Mr. Edminsten's land at that time and later moved on to my side under the instructions that I gave him that day as spokesman for the crowd; he never did to me claim title to the island in opposition to my title or to anybody else that I ever heard of; he tried to get me to make him a quit claim deed to it.

The first time I ever heard of the State of Oklahoma making any claim to the island was when Mr. Kuhlman and I went down there to locate an oil well about a year ago, I believe it was in the fall of 1910; it was about that time that the house which Mr. Lunsford testified to having tried to build on the island was discovered; it had been put there in one day; there never was any claim by the State or any of its officers that it had taken possession of the island at that time and no one came down to look at it although they were notified to do so.

At the time I took possession of this land the south channel did not have any water in it including the full length of that channel; there wasn't a drop of water in a hole. It might be possible that here was one or two. That channel is a mile and a half long and holes sometimes dig but there was nothing to hinder anyone from going over and I don't recollect any hole of water in there at that time. The low water mark in the Arkansas river at that time was north of this land in controversy. Since I have known the south channel the major part of each year it is dry but when there is a rise in the river of about four feet, a little more or less, then water goes through that channel and as the river continues to rise the way it does sometimes, I guess fifteen feet, I think that is about the high water mark, there are several more channels, that is, the water will take up the creek through the center of my farm and crosses on to Mr. Green. I have put up a

[levy] on my farm and can hold out a six foot rise from going through by the use of said [levy]. Both of these
725 channels are sandy but in the field by keeping the water out and plowing off the banks I raise good crops in it when the water don't get extremely high. Before I [leveed] it and began to cultivate it in some places it was too sandy to grow vegetation but in most places the vegetation grew.

I know of other channels up and down the river besides these mentioned. The first place where the water comes through from the main channel into the south channel is up on Section 26 about a mile and a quarter west of the range line and about three-quarters of a mile up the river from the main body of what they call "an island with timber on it". Where the channel breaks across there it is kind of in the form of a creek and is narrower where it first comes in and there is sand in the [channell] there. Opposite the south side of the island there is another creek which opens into the south channel; it is on Lot One in section 25 about twenty rods from the section line between sections 25 and 26. It is about forty rods from the mouth of that creek to the east boundary line of lot One. Water from this creek runs into the south channel, it never goes to the main channel of the river but sinks down that slough some place. In big rises on that creek it will put the water clean through the slough and out on section 30 east of the range line between ranges 8 and 9, but it takes a big rise to do it. The surface of this south channel is not what you call smooth; it has variations in height where drift and stuff catches in the willows and makes good big knolls, I hear they call them little islands. There are one or two low places in the channel that the drift has caught and washed out. I believe there is one hole that is six foot below the surface of the sand, that others are less. There is a seepage along the south channel which is affected more or less by the height of the water in the north channel.

Last Friday night the river rose and was up both Saturday and Sunday morning about three feet, but it was not sufficient to put water around the island on the south channel. Along
726 the east portion of what they designate as the island the bank is decidedly high almost all the way through there where that timber is next to the river, and then gradually slopes off over to the other way with more or less variations in the surface. The bank in any of that island is along by Lots Three and Four of Mr. Green where the channel goes through.

When I first knew the island the larger timber was located on the north bank and principally all over what they are designating as the island from the north bank clean down to where this sand bar comes, there being no particular difference in the biggest timber across there. That big timber such as I could use as saw timber commenced 5 to 8 rods west of the range line, there being no saw timber at all on the opposite side of the range line and on section 30, though you could make wood or something of that kind. I cut and used for building and for other purposes on the farm all that was good enough for saw timber; some of the best timber was two to two and a half feet through, though I do not recollect cutting a tree closer than 6 or 8 rods of the range line.

The point in the picture marked Exhibit "P" where the man is shown to be standing on the extreme south end of the ground is the best I can designate, one-half mile east of any part I think could be called an island. The picture was taken just below what we call a ford. I think the water shown on the right of the center of this picture is in a little slough backed up there where the river drops across from the Osage side to the Pawnee side and then goes straight on east, and that makes a kind of a deception. That back water runs just a little west, hits the bank and goes on.

Going north on the range line there is a little bunch of willows north of the north bank of the present so-called island, it is out in the main channel; there is a little bar runs out from it not much above the water. I have seined around it and recollect it distinctly. There is a small bunch of willows there, formerly there was a boat sunk of some kind, the wood
 727 stuck up there a while. This clump of trees has not increased since I have known it and it is probably a little smaller than when I first recollect it. It is pretty close to the north bank, being clean across the north channel today; I couldn't tell whether the water runs around there or not, though it once ran a very narrow channel there.

At this point in the testimony there was introduced an Oil and Gas Lease dated the 11th day of August 1910 by and between Huston A. Thomas and M. J. Thomas, his wife, of Pawnee County, Oklahoma, parties of the first part, and J. E. Duffey of Tulsa, Oklahoma, party of the second part, whereby in consideration of \$68.75 and the covenants and agreements therein contained to be kept and performed by second party, the first parties leased and let to second party for the sole and only purpose of mining and operating for

oil, etc., the following described property situated in Pawnee County, Oklahoma, to-wit:

Lot 1, 2, 3 and 4 and SE $\frac{1}{4}$ of the NW $\frac{1}{4}$, Sec. 25, Township 21, Range 8, acres 143.50

Lot 2 of Sec. 26, Township 21, Range 8.

SW $\frac{1}{4}$ of NE $\frac{1}{4}$ and Lot 1, Sec. 26, Township 21 Range 8, acres 79; containing 222.50 acres. Total acreage leased, 222.50 acres, more or less, and being the same land conveyed to the first part by deed bearing date.....re-serving, however therefrom 300 feet around the building on which no well shall be drilled by either party except by mutual consent.

Said lease was for a period of three years and as long as oil or gas is produced in paying quantities, containing the royalty provision to first parties of one-eighth part of all the oil produced and delivered in pipe line and \$100 per year for the gas from each and every gas well drilled on said premises, the product of which is marketed, and used off the premises. The other provisions in the lease are the usual and customary ones.

This instrument was filed for record on the 17th day of August, 1910, at 3:15 o'clock P. M. and duly recorded in Book 13, of Miscellaneous Records at page 93.

Also a Contract and Agreement was introduced by and between J. E. Duffey of Tulsa, Oklahoma, and Producers Oil

Company reciting that the said Duffey is the owner of
728 the following described property, to-wit:

An oil and gas lease on part of a certain island in the Arkansas River extending lengthwise with the course of said river, said island beginning at a point at or near the Northeast corner of the Northwest quarter of Section Twenty-five (25) Township Twenty-one (21) North, Range Eight (8) East of the Indian Meridian; thence extending down said river to a point at or near the Southeast corner of the Southwest quarter of Section Thirty (30) Township Twenty one (21) North, Range Nine (9) East, said island lying in the North one half of Section Twenty five (25) Township Twenty one (21) North, Range Eight (8) East lying South of the main channel of the Arkansas River, and also the Northwest quarter of Section Thirty (30) Township Twenty one (21) North, Range Nine (9) East, and the Southwest quarter of Section (30) Township Twenty one (21) North, Range Nine (9) East;

and all that part of said island lying south and west of the main channel of the Arkansas River, all being a part of and adjacent to the North one half of Section Twenty five (25) Township Twenty one (21) North, Range Eight (8) East, lying south and west of the main channel of the Arkansas River as above mentioned, and containing sixty (60) acres, more or less, all in Pawnee County, Oklahoma, the deed conveying said premises to J. E. Duffey not yet having been recorded;

A valid and subsisting oil and gas lease dated August 11, 1910, executed and delivered by Henry Green and Ella Green as lessors, to J. E. Duffey, as lessee, covering the Southeast Quarter of Section Twenty five (25) Township Twenty one (21) North, Range Eight (8) East, Pawnee County, Oklahoma, containing one hundred and sixty (160) acres, more or less, said lease being duly recorded on Aug. 17, 1910, in record 13 of Miscellaneous Records, page 94 in the office of the Register of Deeds, Pawnee County, Oklahoma.

A valid and subsisting oil and gas lease dated August 11, 1910, executed by Huston A. Thomas, and M. J. Thomas, his wife, lessors, to J. E. Duffey, lessee, covering lots One (1) Two (2) and Three (3) and the Southwest quarter of the Northwest Quarter of Section Twenty five (25) Township Twenty one (21) North, Range Eight (8) East, and Lot Two (2) of Section Twenty six (26) and the Southwest Quarter of the Northeast Quarter, and lot one (1) of Section Twenty six (26) all in Township Twenty one (21) North, Range Eight (8) East, containing two hundred twenty two (222.50) and 50/100 acres, more or less, Pawnee County, Oklahoma, said lease having been duly recorded in the office of the Register of Deeds of Pawnee County, Oklahoma, August 17, 1910, Book 13, page 93, of Miscellaneous Records. Said J. E. Duffey having heretofore, to-wit, on August 15, 1910, conveyed by contract unto D. B. Flight and H. E. Burns, all his right, title and interest in and to the aforesaid leases so far as the same effects lot #2 of Section Twenty six (26) Township Twenty one (21) North, Range Eight (8) East, and the Southwest quarter of the Northeast quarter and Lot No. 1, in Section Twenty six (26) Township Twenty one (21) North, Range Eight (8) East.

And then providing for the conveyance of an undivided three-fourths interest of the estate of the said Duffey to the said Producers Oil Company in consideration of \$5,000
 729 and other covenants and agreements in said Contract contained, among which covenants and agreements was

an agreement "to commence the drilling of a well for oil or gas on any tract of the above described land within one year from the date hereof unless said land is thought by second party to be dry or non-productive of oil by reason of drilling operation near to or adjacent to any of said premises."

Said instrument was filed for record on the 13th day of September, 1910 and recorded in Book 13, in the Register of Deeds Office of Pawnee County, Oklahoma, at page 131.

There was also introduced a Quit Claim Deed bearing date of February 2, 1912, from Henry Green as first party to H. A. Thomas as second party whereby first party quitclaimed to second party all his interest and estate in and to the following described property, to-wit:

All of that portion of the land lying in and being a part of what is called an island, located in the Arkansas River said land being adjacent to and an accretion to the land of Henry Green, located in SE $\frac{1}{4}$ of Section 25-21-8; and it is further understood and agreed that this conveyance is not to affect any portion of the land of Henry Green lying in SE $\frac{1}{4}$ of Sec. 25-21-8, located South of the South bank of the Arkansas River, but only that portion of the sandbar accretion to the lands on South bank of the river, lying adjacent to his land, being a part of a so-called island, and bounded on the West by line running north from the point where the River cuts off his land on the west; bounded on the North by North bank of so called island and bounded on the East by the range line between Ranges 8 and 9, in Twp. 21, all of said land herein conveyed lying in Sec. 25, Twp. 21 N., Rge. 8 East; together with all and singular hereditaments and appurtenances thereunto belonging.

Said deed was duly acknowledged and filed for record on February 5, 1912, and recorded in Book 3 on page 382 Deed Records of Pawnee County, Oklahoma.

On cross-examination by Mr. Taylor the witness said:

I cut saw timber off the island to build my house when I settled there; it was in 1894, I think, though I worked all winter between the years 93 and 94. The larger trees were west of the range line—some of them were over two and a half feet in diameter—two feet is about an average of what I cut.

730 In regard to the hole near the island I think it is about six feet deep, that is estimated. I saw the hole

dry once this year; it was dry for quite a period though I don't think it has been dry lately. On the north side of the island during ordinary low water the channel is from just water to about waist deep. It was something like three feet in the deepest place of the channel this summer when the water was lowest. We have had two rises that filled the channel pretty nearly bank full; we crossed the north channel to the oil wells on the ford when the river was lowest; at that time the south channel was dry.

The United States Government offered the island for sale on behalf of the Indian allottees. I made a bid on advertised Indian lands in the Indian country but never did I think it was this island. I knew there were lots on yonder side of the river in section 25; I was trying to bid on lots in the Osage country and put a certified check there; I bid on Lot 7 in Section 25 of range 8 and Lot 11 in Section 30 of range 9 as it was advertised in the Osage country. I knew Section 25 extended across the river. I took these lots to be in the Osage country as they were advertised.

I know how many acres of land the Government calls it in my farm; my farm included what they call "an island"; my farm is described to be Lots 1, 2 and 3 and the southwest quarter of the northwest quarter of section 25 in range 8 east. Since I have gone on this land there is an accretion on the west side of my place as shown by the plat, but on the east end of it is cut away.

Mr. Edminsten put in wheat on the island last fall; I think before this suit was commenced. He grew a crop of [cañfir] corn on it last year.

On re-direct examination the witness further testified:

I made an effort separate from my entry upon the other land to enter upon the island; it was two or three years after; I was claiming the island and in possession of it prior to the time of that application.

731 I was entitled to more land in my homestead and if the patent did not include the island I wanted it included because I did not expect to take any further homestead and I wanted to amend and correct it so as to include this land. The result of my effort to enter this land was they told me I had all the land in the north half of 25, to go ahead, that it included all the government had, and any accretage that had come up to the section line.

On re-cross examination by Mr. Biddeson, the witness further testified:

I know about the use and occupancy of the east portion of the island; that is the part south and east of the range line since the time when I settled in that section of the country; it was occupied by Henry Caldwell; he had that portion of sections 30 and 31 on the Pawnee side opposite that portion of the island; he homesteaded it and occupied it seven or eight years; Mr Edminsten bought it of Mr. Caldwell and immediately took possession. During the time that Mr. Caldwell was the owner of this land he was its real occupant but he hired his labor done and I didn't know all the hands he had; he cultivated little patches over there, there wasn't much clearing to do, we had to crop a little land them days where we could to get the other into cultivation. We cleared some of the best trees for use in building.

Since Mr. Edminsten has owned that tract of land, about ten or twelve years, he has occupied the island and the claims of Caldwell and Edminsten to that part of the land opposite to the Edminsten tract have been open and well known in that community during all of this time; Mr. Caldwell's title was never disputed at all until oil came in that country. . .

MR. HARRY PRAY called on behalf of Milliken Oil Company and W. H. Edminsten, testified:

I am the register of deed of Pawnee County and Book 7 is one of the official records of my office, including page 251.

At this point there was offered in evidence Warranty
732 Deed from Henry L. Caldwell to W. H. Edminsten under date of the 4th of January 1902 reciting that first party in consideration of \$3,000 sold and conveyed unto the second party the following described property, to-wit:

Lots Eight, Nine, and Ten in Section Thirty (30) and Lots One, and Two of Section Thirty-one (31) in Township Twenty one north of Range Nine East I. M., containing one hundred and sixty acres and five hundredths of an acre (160.05)

The other provisions of said Deed were the usual and customary ones and said deed was duly acknowledged and filed for record on the 24th day of August 1907.

There was also introduced and identified by Mr. Pray, Page 95 of miscellaneous Records No. 13, which was an Oil

and gas Lease from W. H. Edminsten and S. C. Edminsten, to the Milliken Oil Company, dated the 16th of August 1910, whereby for a consideration of \$3075.00 and the covenants therein contained, first parties granted an oil and gas lease to second party covering the following described property, to-wit:

Lots Eight (8) Nine (9) and Ten (10) in Sec. Thirty (30) Twp. 21, R. 9 East; Lots One (1) and two (2) Sec. 31, Twp. 21, R. 9 East, containing 166 acres. Total acreage leased 166. And being the same land conveyed to the first parties by Henry Caldwell deed bearing date. reserving, however, therefrom 400 feet around the building on which no well shall be drilled by either party except by mutual consent.

Said lease was for a period of three years or so long as oil or gas should be produced in paying quantities reserving a royalty of a one-eighth part of all the oil produced and saved from the leased premises; and to pay \$100 per year for the gas from each and every well drilled on said premises, the product of which it marketed and used off the premises. The other provisions being the usual and customary ones. Said lease was duly acknowledged and filed for record on the 18th of August 1910.

The witness also identified and there was ordered in evidence Oil and Gas Lease from the said W. H. Edminsten and S. C. Edminsten to the Milliken Oil Company, dated 733 the 21st of November 1910, whereby for the consideration of \$1,000 first parties granted an oil and gas mining lease to second party on the following described property, to-wit:

Certain lands in adjoining or contiguous or adjacent to Lots Nine (9) Ten (10) Eight (8) all in section Thirty (30) Township Twenty one (21) North, Range Nine (9) East, including certain land designated as an island being an area in Section 30, Township 21, north Range 9 East, containing 25.11 acres, more or less, said island lying south and west of south of the main channel of the Arkansas River and including certain sand bars, containing fifty (50) acres, more or less, of which first parties claim ownership by reason of accretion, alluvion or reliction, all of which said lands would lie in Lots Nine 10 and 8 of Section 30, Township 21, North, Range 9 East and be bounded on the North and East by the Main channel of the Arkansas River in the event the

lines of the original survey of said lands were extended to the point of intersection.

This lease to cover all the lands of which first parties are or may become seized or have any right, title or interest in section 30, Township 21, North, Range 9 East and except 166 acres described in a certain lease made by the parties hereto on the 16th day of August, 1910.

And the first parties warrant that they are seized with an indefeasible estate of inheritance in and to said premises above described, containing at least 75 acres, and will forever warrant and defend the title to the same, and to the leasehold estate granted herein.

Said lease was for a period of five years or so long as oil or gas should be produced in paying quantities and reserved a royalty of one-eighth of the oil and a rental of \$100 per year from each gas well from which each gas well is marketed off the premises. The other provisions of said lease were the usual and customary ones. Said lease was duly acknowledged and filed for record on the 25th of November 1910 and recorded in Book 13 in miscellaneous Record at page 220.

No cross-examination.

W. H. EDMINSTEN, being called in his own behalf testified:

I am 54 years of age; born in Newton County, Missouri; am a citizen of the United States but never did enter any land though I have attempted to do so since I bought my homes down here. I wrote to the Secretary of the Interior in regard to this land in controversy as to whether there was any government land there or not. The substance of my letter was that I wanted to find out if there was any
734 government land there as I had never filed on any land; had never taken a homestead and that I wanted to file on it if there was any there. I got a reply but I do not have it now nor do I know what became of it, though I have made search to find it; it is lost, I guess, I can't find it among my papers; my eyes have been in bad shape for three, four or five years and I have lost several papers; I have looked for it in the place where I used to keep papers of that kind. The substance of the reply of the Secretary of the Interior was that there was no government land there; that Lots 8, 9 and 10 in Section 31, Range 9 East, covered all there was there. Later I went to Guthrie to see if there was

anything wrong with it, while the United States Land Office for this District was there, and attempted to enter on this land. The officials in charge of the Land Office told me my lots cover ever everything to the north channel of the river, I was qualified under the laws of the United States to enter a homestead.

I bought this land of Henry L. Caldwell in the winter of 1901. He was in possession of the land at the time and after he sold it, I remained in possession and I have been in possession of the so-called island, to-wit, the tract in controversy, since. I have cut posts, saw timber, also cultivated crops there and have used it in all ways in which it was susceptible. The public in that vicinity have know of my claim.

On cross examination the witness said:

It was about 1903 or 1904 that I wrote to the Secretary of the Interior. As to the contents of the letter I was just wanting to find out if there was any government land there. I asked him whether the island was included in my title. I wrote that I had never used by homestead right and I made application to file on the island and inquired whether there was any government land there. I don't recollect whether I mentioned anything about an island or an accretion being there.

735 It was two or three years ago that I went to Guthrie; I went up to the Land Office to see whether there was an island in the river. The man in charge of the office took the plat and looked it over and he told me to go back home; that there was nothing there. I did not file a written application while I was there.

I planted wheat on that island in the fall of 1910. John Flight was upon that island for a while, but I don't think he was there as early as 1904; he was there not more than a few years; possibly he might have claimed it, I didn't know that he did. I heard he tried to enter the island.

Here the defendant Edminston rested his case.

736

Plaintiff's Rebuttal Testimony.

H. J. BEHNING, recalled in rebuttal by the Government, testified as follows:

Witness states that he is the same Mr. Behning who testified in this case several days ago, since which time he

has been to Turkey Island, the island in controversy in this suit. He states that he visited the island on December 24, 1915, and took with him a copy of the Government's Exhibit 10. He states, after making observations, he found that practically the same situation exists there today, with some minor changes, as existed at the time he surveyed the island as shown by Exhibit 10. The changes, witness states, are not material, consisting of a little bit of erosion and accretion. He states that Exhibit 10 still substantially sets forth the conditions surrounding the island in respect to which it was prepared to set them forth, and applies to the line of vegetation as well as to all the other data given thereon, concerning which he has testified.

Here the Government called the court's attention to the following acts of Congress:

Act of August 4, 1894, 28 Stat. 225;

Act of July 16, 1894, 28 Stat. 103;

Act of February 8, 1895, 28 Stat. 644, and

Act of August 5, 1886, Section 6, 24 Stat. 333.

In the annual report of the chief of engineers for 1887 in reference to the Arkansas river and other rivers under the jurisdiction of the office at Little Rock, there is attached a report by H. S. Tabor, which the Government here offered in evidence as Exhibit 71.

Here the Government called the court's attention to Acts of Congress of August 11, 1888, 25 Stat. 422 and Act of September 29, 1890, 26 Stat. 451.

P. R. VAN FRANK, JR., recalled in rebuttal by the Government testified:

Referring to complainant's Exhibit No. 68, a hydrograph of the Arkansas river at Tulsa, Oklahoma, witness states that that hydrograph was made from the publications of the Weather Bureau giving the daily stages of the rivers
737 of the United States for the years 1905 and 1907 up to the middle of November, 1915. This Exhibit, he states, shows the height of the rises each day and their duration during each day in the year. This Exhibit, witness states, was made by the Miller Engineering Company and was checked by him from certified publications. He states that the figures to the left-hand side running horizon-

tally opposite the figure giving the year, represents the gauge heights or markings by feet and is the reading of the daily gauge. With reference to the zero gauge—for instance, four is four feet elevation above the zero gauge. Six would be six feet above it; eight eight feet above it, and has reference to the stage of the water on the Tulsa, Oklahoma, gauge. From his knowledge of the Arkansas river, witness states that in his opinion the necessary stage of water to be shown by the Tulsa gauge in order to afford a commercial channel in the river of two feet would have to be over five feet as indicated by the figures on the left-hand side showing the feet. Referring to complainant's exhibit No. 69, a hydrograph of the Arkansas River at Webber Falls, Oklahoma, witness states that he checked that hydrograph in the same manner with the Weather bureau gauge as he did the one to which he has just testified. This exhibit, he states, represents the daily changes or [cancellations] in the river's surface at Webber Falls, Oklahoma, beginning in the year 1904 and ending in August, 1911. He states that he checked all the Weather Bureau gauges that were furnished to him. Referring to the hydrograph showing the Tulsa gauge and the testimony of a witness for the defense that there were five rises in the Arkansas river near the island in controversy, 31 miles above Tulsa, the first being April 29, 1915, witness states that the hydrograph shows a rise that occurred in the latter part of April which reached a height of nearly twelve feet on the gauge at Tulsa on that date. The next high rise which was testified to as being the highest of the year, and for several years, was May 26, 1915. This, witness states, is correct, and is about fourteen six on the Tulsa gauge. The next testified to as of

738 June 8, 1915, also appears, the height being between thirteen and fourteen feet. The rise of June 26, 1915, was also mentioned as high water. This, witness states, the relatively low as compared with the others. This rise, he states, went a little above nine feet on the Tulsa gauge, and on the 1st of July there was a rise that went to just about eleven feet, maybe a little less, or a tenth or two over. The rise of September 16, witness states, also appears and shows about ten and one-half feet. Witness states that he checked these Weather Bureau gauges during the last week and before the testimony of Mr. O'Connell. He states that the publications and gauge records used for the making of the hydrograph for the year 1915 were made from information the Miller Engineering Company obtained direct from the Weather Bureau, consisting of printed

pamphlets. These pamphlets, witness states, are an unpublished record as yet. That is, it is published daily on their Weather Bureau maps that give the gauge readings, but the information he got was just a tabulation that he got from the Weather Bureau. Witness states that since he has been employed by the Little Rock office in 1893, they have held that the South Canadian river involved in the issues in this case is not navigable. As to the holding of the War Department upon the question, witness states that he does not know that they have ever made a positive statement as to that.

Cross-Examination

By Mr. Burwell:

Referring to Exhibit No. 68, witness states that the lower line represents the rises in the river during the year 1915, and that a rise of five feet at Tulsa would show the river navigable with a two foot water channel. He also states that during the year 1915 there were seven rises in the river, which showed it to be above five feet. The first rise, witness states, lasted three days and rose between seven and eight feet; the second rise lasted five days in April and rose eight feet and one-half. The third rise occurred in April and May and lasted eight days, the height being nearly twelve feet. The next rise rose eight feet and the one after that, which occurred in May, was fourteen feet six inches. This last rise, witness states, was the high point. The next high point, after that, was thirteen and one-half. 739 when it varied to the 1st day of July when it was at approximately eleven. The date of the first rise, witness states, was on May 21st, and the river continued above five feet until about the 11th or 12th of July. On several other dates, he states, it went slightly above five feet. On September 15th it went above five feet and continued above five feet until October 4th, the highest point during this latter rise being about ten feet three. On October 17th there was another rise which continued for seven days, the highest water being ten feet three. In May, 1914, witness states; there was a rise of about nine feet seven, then there was another rise in September which went to about six feet two. In 1913, he states, there were three rises that went above five feet. In 1912, witness states, the highest point of any of the rises during that year was sixteen feet three. The highest point for 1911, he states, was about fourteen two and during that year, he states, there were four rises that went above five feet. In 1910 there were three rises, in 1909, seven rises that went above five feet, and the highest point for 1909,

witness states, was fourteen feet. In 1908 counting the little rises of a day or two, witness states, there were eleven rises during the year that went above five feet and these occurred in the months of February, March, April, May, June, July, September, October, November and December, and there would have been a two foot channel depth every month of that year except two. In 1907, he states, there were six rises above five feet, and the highest point during that year was ten and one-half feet, the highest point reached in 1906 was eight feet, and the highest point in 1905 seven feet one inch, and there were eight rises during the latter year taking a duration of two days as one of the rises that went above five feet.

By Mr. Kearful:

Witness states that in order to make a two foot channel the gauge would have to read above five feet and that he has constructed a table showing the days of each year from 1905 to 1915 as shown by the hydrograph, Exhibit 68, at 740 which the gauge at Tulsa was over five feet. At this point, the witness produces this table, and it is introduced in evidence as Exhibit 72, as follows:

Days that Arkansas River above 5 ft. on Tulsa gauge.

(Highest water 17.7 in 1908) Lowest water 1.0 in 1910)

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1905	0	2	2	4	6	18	7	4	1	0	0	0	44
1906	0	0	0	0	1	0	1	7	16	0	0	5	30
1907	11	0	0	1	17	11	5	3	0	0	0	3	51
1908	0	13	6	12	13	28	13	0	5	10	2	9	111
1909	0	0	1	0	9	8	1	1	0	0	10	6	36
1910	6	0	0	0	2	0	0	1	0	0	0	0	9
1911	0	1	0	0	0	5	7	10	2	0	0	0	25
1912	0	0	4	12	19	1	0	1	0	0	0	0	37
1913	0	0	0	2	4	0	0	0	0	0	0	6	12
1914	0	0	0	0	5	0	0	0	4	0	0	0	9
Average	1.7	1.6	1.3	3.1	7.6	7.1	3.4	2.7	2.8	1.0	1.2	2.9	36.4
1915	0	0	3	9	19	30	12	2	14	11	0	11 m'ths	100

In October 1908 a rise of 10.1 ft. in 24 hrs. occurred.

Drainage area above equals 71048 sq. miles (15747 belonging to Cimarron.

By Mr. Burwell:

Witness states that the number of days for the year 1915 is computed up to November 30 and on the right hand side of the table is the total number of days in the year, and for

1915 the total number of days is given for eleven months to the end of the record.

By Mr. Kearful:

Witness states that the number of days shown for each month as given in the table are not consecutive days but that they are the total number of days in each month, viz: in 1905, they are eighteen days in June, and you have to refer to the hydrograph to see whether those are consecutive days.

By Mr. Burwell:

Witness states that in 1913 the water was lower than in 1914, but that the average days that the water was above five feet were fewer in 1914 than during any year from 1905 to 1915 with the exception of 1910, there being but nine days in each of those years that it was above five feet. In 1913 there were twelve days that it went above five feet.

741 The Government here offered certified copies of certain correspondence between Department of Justice and War Department. The first letter was dated July 11, 1911, heretofore set out herein, and the others are exhibits numbers 73 to 90 readings as follows:

(Plaintiff's Exhibit 73.)

War Department

30010 - 8 W. D.

Washington, wsh

79270 Engrs

May 13, 1914,

XXXXXXXXXXXXX

Ans. 5/16/14.

The Honorable,

The Attorney General.

Sir:

Referring to letter of your Department dated May 6, 1914, relative to the navigability of the Arkansas River where it borders on the Osage Indian Reservation, I have the honor to inform you that on a similar inquiry from your Department dated September 25, 1911, the matter was investigated and in a letter dated October 11, 1911, it was stated that—

"it appears from a report of the engineer authorities that said river at the locality mentioned is a navigable waterway within the purview of laws enacted by Congress for the preservation and protection of such waters and of decisions by the Supreme Court of the United States on the subject, and the Department has uniformly so held."

No applications have been received by the Department for permission to place obstructions in the bed of the Arkansas River at the locality in question.

The matter will be referred to the district engineer officer and as soon as possible you will be further advised in the premises.

Very respectfully,

HENRY BRECKENRIDGE,
Assistant Secretary of War.

742

(Plaintiff's Exhibit 74.)

War Department

HT/JES

Washington,

September 16, 1914.

Memorandum for the Department of Justice in re Arkansas River.

With respect to the question of the navigability of the Arkansas River, the Attorney General, in his letter of the 19th ultimo, claims that the statements made in War Department letters of October 11, 1911, and May 13, 1914, are not supported by the reports of examinations and surveys published in certain Congressional documents, and asks for a further consideration of the matter, and for a further expression of the views of the War Department.

The question at issue is whether the Arkansas River, where it borders on the Osage Indian Reservation, in Osage County, State of Oklahoma, is navigable. In the aforesaid letters it was stated that the War Department held that this section of the River is a navigable waterway, within the meaning of the laws enacted by Congress for the preservation and protection of such waters; and this statement is claimed to be at variance with the information and the data set forth in the aforesaid printed reports.

It is well settled by decisions of the Supreme Court that the question of navigability is one of fact, a river being navigable in law when it is navigable in fact. The question whether the Arkansas River at the locality mentioned is navigable, does not depend upon the declaration of holding of this Department, but upon the actual facts as they now exist. The War Department is not vested with the power to fix the status of this or any other stream, nor to determine conclusively the question of navigability. The statement to which the Department of Justice excepts is merely an expression of the War Department's opinion, based upon the facts at hand, that this section of the river is navigable and that these facts are such as to justify the application of the laws of Congress thereto; but this opinion is not conclusive. The Department of Justice might reach a different conclusion from the same state of facts; or, if the War Department should try to apply and enforce the law by judicial process, the courts might hold adversely on the ground that the Department's conclusion was erroneous, and not justified by the facts.

The Arkansas River is one of great length, and of varied and varying characteristics. No definite survey or detailed examination of the upper sections of the stream has been made in recent years and the information as to present conditions is by no means full or accurate. The present head of steamboat navigation is generally admitted to be the mouth of Grand River near Fort Gibson, Okla., but the capacity for steamboat navigation is not alone the determining factor in fixing the limit of a stream's navigability, as there are other forms of navigation, such as flatboats, rafts, and even the floating of loose logs, and a river capable only of these kinds of navigation may be classed as a navigable waterway. Moreover, in deciding whether it must hold *prima facie* that a stream is navigable, the War Department must some times be governed by other considerations, in addition to those of supposed navigable conditions, such, for instance, as acts of Congress or court decisions.

743 Briefly stated, the position of the War Department, as expressed in the aforesaid letters, with respect to the section of the Arkansas River bordering on the Osage Indian Reservation, was based, to a large extent, on the following considerations:

1. That Congress in the river and harbor act of March 3, 1879, made an appropriation for improving Arkansas River

between Fort Smith, Ark., and Wichita, Kans., a section which includes the Osage Indian Reservation, the latter point being about 208 miles above the said reservation. This appropriation was based on a report published in House Ex. Doc. No. 94, 45th Congress, 3rd Session, and with the money appropriated a snagboat worked up to the vicinity of a point known as "Pawnee Agency", about 20 miles above the reservation.

2. In the river and harbor act of August 11, 1888, Congress adopted a comprehensive project for the improvement of Arkansas River from its mouth to Wichita, Kans., and made specific appropriations therefor.

3. Again, in the river and harbor act of September 19, 1890, Congress appropriated \$180,000 for improving the river from Wichita, Kans., to its mouth. And further, made a specific appropriation of \$20,000 for operating snagboats and removing obstructions from the river between the mouth and Wichita.

4. In the river and harbor acts of 1892, 1894, 1896 and 1899, further appropriations were made for the improvement of the river in accordance with the aforementioned project.

With the exception of the first item of appropriation, these moneys were all expended on that section of the river between the mouth and Grand River, which is below the Osage Indian Reservation. But it goes without saying, if the condition and capacity of the stream above the Indian Territory, or what is now the Oklahoma State Boundary line, were such as to cause Congress to adopt a systematic scheme for its improvement, and to make appropriations extending over a period of more than 14 years, the War Department on this account alone, is not only justified in holding, but cannot do otherwise than hold, that this portion of the river is a navigable waterway and subject to the laws of Congress.

The War Department is advised of the important litigation to which the Department of Justice refers as depending on the question of the navigability of the river, and, recognizing that the question is, in the last analysis, one of present fact, to be established by proof and not by opinion, has refrained from any recent action or expression that might embarrass or hinder the successful conduct of that litigation. All the reports on examination and surveys of the river, and all the information and data available in this Department

have been made accessible to the representatives of the Department of Justice. Upon these facts this Department came to the views heretofore expressed in the letters of October 11, 1911, and May 13, 1914. Upon the same facts the Department of Justice may, of course, reach a different conclusion, or it may establish a different state of facts by an investigation of present conditions on the river. This Department, however, sees no reason for changing its position in the matter/

Very respectfully,

LINDLEY M. GARRISON,
Secretary of War.

79270/4 E.D.

744

(Plaintiff's Exhibit 75.)

War Department

Washington, March 23, 1915/

The Honorable,
The Attorney General.

Sir:

Your Departmental telegram dated March 9, 1915, has just been brought to my attention.

As we have informed your Department upon previous occasions, the sections of the river adverted to are, in the judgment of this Department, navigable waters of the United States, having been frequently so dealt with by the Congress of the United States and by the Engineer Corps of the United States Army.

If it is desired, on behalf of whomsoever your Department represents, to produce proof that these sections of these rivers are navigable waters of the United States, I will detail an officer with full knowledge, to appear and testify. If, on the other hand, it is the view of your Department that these sections are non-navigable, then I could not detail any one from the Engineer Corps of the United States Army to testify to that effect, because it would be in contravention of the records, decisions and treatment in that Corps.

If you will give me further information in the circumstances I can act advisedly.

Very truly yours,

LINDLEY M. GARRISON,
Secretary of War.

745

(Plaintiff's Exhibit 76.)

G-P

August 6, 1915/

Hon. Lindley M. Garrison,
Secretary of War.

My Dear Mr. Secretary:

After discussing with you some sixty days ago the question of whether the Arkansas River is navigable above the point of its junction with the Grand River, I have had the law and facts carefully looked into and am herewith sending to you a copy of a memorandum compiled by Attorney Francis J. Kearful of this Department, in charge of this litigation. Assistant Attorney General Knaebel has likewise reviewed the matter and reached the same conclusion as Mr. Kearful. I also concur after giving a good deal of thought to the matter.

According to the Supreme Court of the United States and other Federal Courts, in order for a stream to be navigable, it must be navigable in fact, and this depends upon whether, in its natural condition, it affords a channel for useful commerce of a substantial and permanent character. The decisions on the subject appear on pages four to eight of the memorandum and to my mind are conclusive. The memorandum contains a description of previous litigation, excerpts from many historical documents and a recital of facts which seem to me to clearly show that the Arkansas River at its junction with the Grand River is not navigable, as tested by the established rule above stated.

In the opinion of this Department, the ability of the Government to recover for certain Indian tribes portions of the bed of the Arkansas River above its junction with the Grand, of enormous value on account of the deposits of oil and gas, depends upon the establishment of the non-navigability of this portion of the stream. These suits are to be tried about the middle of September, and it is of the utmost importance that

we have testimony on certain points as to present conditions, namely:

(1) The width and character of the Arkansas above and below the confluence of the Grand and Verdigris rivers;

(2) The volume of water flowing in the Arkansas, the Grand and the Verdigris rivers;

(3) The necessity to provide a navigable channel at low water in order to make the Arkansas commercially navigable because of the character and irregular occurrence of freshets; and

(4) The practicability of contracting the channel to provide a navigable low water channel in the Arkansas above the Grand.

Major A. B. Putnam, in charge of your office at Little Rock, and Assistant Engineer P. R. Van Frank? Jr., of the same office, are unusually well acquainted with the facts and well equipped to make the examination and testify to the conditions; the latter has been in the Little Rock office more than twenty years and perhaps knows the Arkansas River better than any other person.

The principal point is as to the volume of the flow of water in the three rivers referred to; as this varies, it would be well to have measurements made once a week for three or four weeks beginning about August 15th.

746 The entire operation would not extend over an area of more than one or two miles at the junction of the three streams near Muskogee.

I would appreciate it very much indeed if you would assist the Government in this litigation by requesting Major Putnam and Assistant Engineer Van Frank to make the examinations desired and testify in these cases on the points alluded. I believe that an examination of the memorandum I am furnishing you will convince you that the Government's contention both as to the law and the fact is correct. The employment of engineers in private life to make these investigations would be both expensive and unsatisfactory, and I know no such individuals who could do it with the skill and accuracy of the Government officers above named or whose statements would carry the weight that their's would.

Please let me hear from you promptly as the time for making the investigation is now becoming quite short.

The copy of the printed memorandum which I am sending you is highly confidential, and I will ask you please to so treat it.

Faithfully yours,

T. W. GREGORY,
Attorney General.

(Plaintiff's Exhibit 77.)

War Department DCK-GJK

Washington, August 12, 1915/

The Attorney General,

Sir:

In reply to your letter of August 6, 1915, requesting the detail of Major A. B. Putnam, Corps of Engineers, and Mr. P. R. Van Frank, Jr., to take stream measurements in the Arkansas River, I have the honor to inform you that your request has received the very careful consideration of the Chief of Engineers, as well as myself.

The Chief Engineers expresses his views on the matter in part as follows:

Major Putnam has recently died and his detail cannot therefore be considered. Mr. Van Frank could undoubtedly determine with reasonable accuracy the volume of flow of the rivers as requested by the Attorney General, but the data which would thus be obtained would be so meager that it could in no event have any practical bearing upon the question. It might happen that the river was in an exceedingly low stage, a medium stage, or a very high stage on the dates mentioned. To obtain information of any value whatever as to the flow of a river, the observations should be extended over a period of years, not of days. If such testimony as is proposed by the Attorney General should be given by a representative of the Engineer Department, it would be so subject to attack by the opposing parties as to make it dangerous, and any man who posed as an expert and based any conclusions upon such insufficient data could be made to appear so ridiculous that the effect could only be detrimental to the side of the case for which he appeared.

I strongly recommend that the detail of any officer or employee of the Engineer Department for the purpose of taking stream measurements of the Arkansas River to be used in the case to be tried in September, proximo, be not made.

I concur in the views of the Chief of Engineers, and therefore regret that I am unable to accede to your request.

The confidential memorandum inclosed with your letter is returned herewith.

Very respectfully,

LINDLY M. GARRISON,

Secretary of War.

79270/7 E. D.

79270/8 E. D. Accomp'g

(Plaintiff's Exhibit 78.)

August 18, 1915/

Hon. Lindley M. Garrison,
Secretary of War.

Dear Mr. Secretary:

In the River Bed bases pending in Oklahoma which are being prosecuted by the government for the benefit of the Creek and Osage Indians in opposition to the claims of the State and certain private interests said to be closely affiliated with the Standard Oil, the main contention of the government is that the Arkansas River is not navigable above the mouth of Grand River.

In a letter written by Acting Secretary Oliver, dated October 11, 1911, it was stated that:

"It appears from a report of the engineer authorities that said river at the locality mentioned is a navigable waterway within the purview of laws enacted by Congress for the preservation and protection of such waters and of decisions of the Supreme Court of the United States on the subject, and the Department has uniformly so held.

This statement of the position of the War Department was re-iterated in your letter dated May 13, 1914.

In your memorandum of September 16, 1914, responding to a request for a further expression of your views on this matter you stated at some length your reasons for this attitude.

748 In your letter of March 23, 1915, in answer to a request from this Department, you declined to detail a member of the engineer corps of the army to make an investigation and testify in these cases on behalf of the govern-

ment's contention, for the reason that such action "would be in contravention of the records, decisions and treatment of that corps."

On August 6, 1915, I wrote you asking you to detail a member of the engineer corps of the army to make certain observations of the flow of the Arkansas River and the actual conditions thereof above the point indicated, with a view of using him at the trial of the cases referred to as a witness for the government to establish the results of his observations; on August 12, 1915, you replied declining to make such detail.

As heretofore indicated to you, it is my opinion that the conclusion reached by Mr. Oliver, and announced in his letter, dated October 11, 1911, and adhered to by you, is erroneous, and that the facts on which it is based do not sustain it under decisions of the Supreme Court and other federal tribunals.

The value of the property involved in the suits referred to is estimated at some \$20,000,000, and the contention of the government is that at the point referred to the Arkansas River is not a navigable stream, and in order for it to prevail in these suits, it is necessary to establish that fact.

The letter of October 11, 1911, does not state the basis for the opinion therein expressed.

A copy of this letter is in possession of our adversaries in these cases, and it was introduced in evidence in a similar case in one of the Oklahoma state courts. It will, of course, be offered in the cases now pending. It seems clear to me that the government is entitled to a statement from your Department of the facts and reasons on which its opinion is based, in such form that it can be presented to the court in explanation of this letter when the latter is offered in evidence by our adversaries.

If the opinion so expressed is a correct one, it will prevail. If it is not a correct one, it shall not prevail.

I desire to take the testimony of some officer of your
749 Department having full knowledge of the matter. I therefore have to request that you detail such an officer to testify fully in these cases as to the facts and reasons relied on to support the view of your Department. It is expected that the cases will be tried at Muskogee, Oklahoma about the middle of September. The expense will be borne by this Department.

The officer designated should be able to identify all of the reports and other documents leading to your Department's conclusion, and should be competent to testify that they constitute the whole record upon which the conclusion rests. To prepare himself he should of course make a careful examination of all the files relating to the water flow and other characteristics of the river at the place in question.

On account of the emergency, I shall be pleased to have you give this matter prompt consideration.

Faithfully yours,

T. W. GREGORY,

Attorney General/

(Plaintiff's Exhibit 79.)

War Department

79270 (1914) Engrs.

Washington, August 21, 1915/

The Honorable,

The Attorney General.

Dear Mr. Attorney General:

I beg to acknowledge receipt of your letter of August 18, 1915, to the Secretary of War, including the statement that the matter treated of constitutes an emergency and asking that it be given prompt consideration.

The War Department is entirely willing to furnish to the Department of Justice certified copies of all correspondence, rulings, opinions and decisions that may be pertinent to the issue as to the navigability of the Arkansas River and form the basis of the Department's conclusion that the Arkansas River is a navigable waterway.

No subordinate of this Department is in a position
750 either to substantiate or put in question the correctness of a finally approved conclusion of the Department. Therefore, to detail an officer as you request could accomplish nothing in lending a convincing character to the conclusion of the Department; nor is it to be admitted that such a subordinate, who possesses no jurisdiction to shape or determine a conclusion of the Department, should be utilized to undermine, either when submitted to direct or cross-examination, a deliberate conclusion of the Department.

Regretting, therefore, that I cannot see my way clear to comply with the request in your letter of August 18th, I am

Sincerely yours,

HENRY BRECKENBRIDGE,
Acting Secretary of War.

(Plaintiff's Exhibit 80.)

August 23, 1915/

The President,
The White House.

Dear Mr. President:

I herewith enclose copies of two letters, one written by me to the Secretary of War on August 18th last, and the other, a reply thereto, from Acting Secretary of War Breckenbridge, dated August 21st last. The reply of the Assistant Secretary is quite general, in character, but clearly indicates that I am making no progress. As shown by the letter addressed to the Secretary of War, prompt action is essential. I therefore conclude that it is best to state in this letter exactly what I think we are entitled to.

For the proper protection of the Indians' rights it is essential that I lay before the courts a deposition by some official of the War Department, bringing out as clearly as possible the facts and reasons which induced that Department to say, in its opinion of October 11, 1911, and to re-iterate since, that the Arkansas is navigable at the places in question. Some one from the engineer corps should be detailed by the Secretary to make an immediate and complete examination of all the files which might throw some light on the subject, and, when called as a witness, identify and produce correct copies of all papers of whatsoever description that are relevant to this question of navigability, showing by his oral testimony that his search has been exhaustive and that the documents produced are all that could be found bearing on the question pro and con. He should also be prepared to explain what if any evidence there is of record indicating that other documents relating to the question may have existed of record and been lost or mislaid. The task of this witness, if intelligently and conscientiously performed, will put the courts in possession of all the facts upon which the attitude of the Department is based, and the courts will be in a position to draw their own conclusions. But it would be far more satisfactory to me, and I believe to the courts, if in addition the

Secretary himself, or at least some official of the Engineering Corps specially deputed to speak for him, could be induced to give by deposition a full explanatory statement of
751 all the reasons known in the Department, whether they be based on records or not, for adhering to the views expressed in the letter of October 11, 1911.

If that view be correct, it will prevail; if not correct, it should not prevail to the detriment of the wards of the Government to the extent of some \$20,000,000. All that I am seeking is to bring out the facts and reasons which constitute the basis for the "ipse dixit" of October 11, 1911.

Faithfully yours,

T. W. GREGORY,

Attorney General.

Plaintiff's Exhibit 81.)

The White House,

August 25, xxx, 1915.

My Dear Mr. Secretary:

The Government, as you know, as an extremely important suit pending for the protection of the oil rights of the Osage Indians under the bed of the Arkansas River, and the Attorney General has brought to my attention his recent correspondence with the Department of War in which the Department declines to assist the Government by enabling it to test the question as to whether the portion of the river affected by the litigation is navigable or not.

I note that the department is willing to put its files at the disposal of the Department of Justice in this litigation but that it takes the position that it will adhere to its decision of an earlier year that the Arkansas is navigable at the point in question without giving the reasons which led to that conclusion.

Personally, I think that this is a serious mistake. I should feel very much distressed if there should be any lack of co-operation between the executive departments of the Government in matters which affect its functions in any department, and I am sure that it is not in that spirit that the position of the War Department has been taken. I, therefore, feel the more free to request that this whole matter be reconsidered and that the Department of War lend the utmost assistance

to the Department of Justice in this extremely important case.

Cordially and sincerely yours,

WOODROW WILSON,

Hon. Lindley M. Garrison,
Secretary of War.

752

(Plaintiff's Exhibit 82.)

War Department

Washington, August 26, 1915.

My Dear Mr. President:

I have yours of August 25th concerning the suit respecting the oil rights of the Osage Indians.

The Attorney General has evidently misapprehended the position of this Department. That position is as follows:

To the extent that the Federal Government has jurisdiction over interstate navigable streams, the administrative exercise thereof is vested in the War Department. Broadly speaking, the Supreme Court of the United States has held upon this question that navigability, or that which affects navigation, is a question of fact depending upon numerous considerations. If the Congress has, with respect to such a stream, treated it as if navigable, the Supreme Court has held that this is determinative upon the question of fact. The question is one of supreme importance; if the feeders of the Mississippi River were blocked off from flowing into it the navigability of the Mississippi River would be impaired, if not entirely destroyed. It is therefore vital to the federal government with respect to this question of navigability to maintain to the utmost point of reason the jurisdiction of the federal government over everything which affects the navigability of interstate streams. The mere fact that at a particular point or points in a stream no boat of commerce could float is not, and never has been held to be determinative of this question. Of course, if there be sufficient water to float boats of commerce, that fact is determinative, but the converse is not true, and very often the sole purpose of an act of Congress is to produce navigability where none before existed. It is therefore largely a question of potentiality, rather than of existing conditions. With respect to the specific stream in question, this Department, in a memorandum made out for the Department of Justice, dated September 16th, 1914, set forth

various and numerous instances where the Congress specifically treated this portion of the stream as navigable by appropriation of money and provisions for the doing of government work therein. If, in the suit in question, the War Department could with propriety be heard, it would be its duty to urge by every legitimate means upon the court the imperative necessity of deciding the navigability of this stream at the place in question. This duty would arise because of the principle involved, and the numerous instances of a similar character depending upon the establishment of that principle. If, in the specific case, it should be decided that a stretch of water of this character, which Congress had treated as navigable by the appropriation of money and the ordering of work therein, was not in fact navigable, such a decision would practically undermine and destroy the essential foundations upon which the custody of navigable streams depends. If the federal government has not the power and jurisdiction to control the flow of water which is essential to the navigability of navigable streams, then its apparent jurisdiction over navigable streams is not real. If the purpose of the suit in question is to obtain a decision that the title to the bed of this river is vested in certain citizens or others who have the right, by reason of ownership, of impeding the flow of the streams or excluding the federal government from interfering with the bed of the stream, then it has for its purpose a determination which would overthrow the existing basis of federal jurisdiction on this whole subject matter.

In an interview which I had with the Attorney General, I took the liberty of pointing out to him that I felt that he had an initial duty before determining the scope, methods and proof of the case on behalf of the Osage Indians—if they are the particular parties in interest. I stated to him, as I have above briefly stated to you, the underlying principle involved in the subject matter. I said that if the United States government was a party to this suit, it would become his duty, as Attorney General, to determine what the proper
753 legal position of the government should be under all the circumstances, and then to maintain it. I did not think, and so told him, that the fact that the wards of the nation were parties, instead of the nation itself made any difference in his duty in this respect. If the Interior Department were, in its own behalf, claiming title to the bed of this stream, as an incident to which it claimed the right to dam it up, or divert it, or do whatever one has a right to do with non-navigable streams, were contending, as it would that

under all the circumstances this was a navigable stream, had been so treated by Congress and should have to be so treated by the government, then it would become the duty of the Attorney General to determine which was the correct view of the law. That is what I still think about this suit. I do not think that the Attorney General should maintain in this suit that a stream which has been treated as this one has been by Congress, should be declared to be a non-navigable stream. If he does so contend, a most grievous injury will ensue to the nation.

I hope I have made it sufficiently clear in the above why I did not feel it possible for the War Department to furnish witnesses to the government in this suit. If one or more engineers of the Department were to go to this portion of the river and make measurements and testify with respect thereto, they would only be doing what any other engineer is equally competent to do. If they go for any other purpose they are without proper authority to testify. In other words, they cannot go and properly testify that this is, in the judgment of the War Department, a (non) navigable stream. They could not give any other reasons than those which this Department has already given, or stands prepared to give. It would be putting the War Department in a totally false position, one which I feel it has no right whatever to occupy, to order engineer officers to go and testify at this trial as to any other things than physical facts, and there their testimony is of no more value than that of other observers of physical facts. To the extent that their presence would reflect the judgment of the War Department, in view of the conditions produced by legislative action, their testimony would be illusory, because they would have no right to speak on behalf of the Department in those respects.

I am sure that you will realize that you were mistaken in believing that I had declined to assist the government, or that I had not given the reasons which led to the conclusion that we had reached. I am very desirous in this, as in all other cases, of the fullest co-operation, but I cannot, as at present advised, act with another department of the government to destroy or impair one of the most important trusts confided to my jurisdiction.

Sincerely yours,

LINDLEY M. GARRISON,
Secretary of War.

The President.

(Plaintiff's Exhibit 83.)

The White House,
Washington,

August 28, 1915/

My Dear Mr. Attorney General:

Here is the answer of the Secretary of War to my letter (of which latter I send you a copy) concerning the question that has arisen between your department and his in connection with the suit touching the oil rights of the Osage Indians.

I would like very much to have your view of the case
754 as presented by the Secretary of War who seems to have put some elements into his discussion of the matter in his letter which perhaps he did not fully develop in his conference with you.

Cordially and sincerely yours,

WOODROW WILSON/

ences/

Hon. T. W. Gregory,
The Attorney General.

(Plaintiff's Exhibit 84.)

September 3, 1915/

The President,
The White House.

My dear Mr. President:

In the absence of the Attorney General I have the honor to respond to your letter of August 28, 1915, with reference to the River Bed cases in Oklahoma, in which you request the Attorney General to give his view of the matter as presented by the Secretary of War in his letter of August 26, 1915/

It seems to me that the Secretary disconceives the purpose of the suits in question. Their purpose is to establish, as against the State of Oklahoma and its lessee oil companies, the title of the Creek and Osage Indians to the bed of the Arkansas River in the Creek country and where it bounds the Osage country. For this purpose it is necessary to maintain that the Arkansas is not navigable above the mouth of Grand River. If the stream is not in fact navigable above Grand River, the courts will so decide, and such a decision will not in any manner impair the rightful jurisdiction of the federal government over the lower and navigable portion. If neces-

sary to the maintenance of the navigability of the lower Arkansas, the government is entitled to the unrestricted flow of all of the water in the upper Arkansas, notwithstanding the upper Arkansas be held not navigable and the title to its bed be vested in the adjoining owners, just as the government is entitled to the unrestricted waterflow of small tributaries whenever necessary to maintain the navigability of the principal stream. That right was fully vindicated in an opinion recently rendered by the Attorney General to the Secretary of State with reference to the Rio Grande. If such a necessity should arise, it would be the plain duty of this Department to vindicate the same right by suit in the courts, at the behest of the Secretary of War, with respect to the Arkansas. But that is a very different thing from maintaining the navigability of the upper Arkansas and its tributaries.

The lower Rio Grande is a navigable stream. Of this, the Supreme Court took judicial notice in the case of the United States vs. Rio Grande Irrigation Co. 174 U. S. 690, 698. But the court also held (p. 699) upon consideration of the evidence, that the upper Rio Grande, within the limits of New Mexico, is not a navigable stream, because, as the Court said: 755 "The Rio Grande within the limits of New Mexico is not a stream over which in its ordinary condition trade and travel can be conducted in the customary modes of trade and travel on water. Its use for any purposes of transportation has been and is exceptional, and only in times of temporary high water." Nevertheless the court sustained the right of the Attorney General to protect the navigability of the lower river by proceedings to restrain the appropriation of water in the upper portion, to the same extent that he would have the right to protect any navigable waterway by suit to restrain the appropriation of water in its non-navigable tributaries (p. 709) The Court thereupon directed (p. 710) "an inquiry into the question whether the intended acts of the defendants in the construction of a dam and in the appropriation of the waters of the Rio Grande will substantially diminish the navigability of that stream within the limits of present navigability and if so to enter a decree restraining those acts to the extent that they will so diminish."

The result of the decision in the Rio Grande case is that the State of New Mexico can have no claim of title to the bed of the Rio Grande within the State, but that such title pertains to the individual proprietors along the banks. Indians in that position are clearly entitled to the protection of the government in their ownership of the bed of the upper Rio

Grande, while the government is equally entitled to the undiminished waterflow thereof, if necessary, to protect the navigability of the lower Rio Grande. The present case of the Arkansas is exactly parallel in this respect to the case of the Rio Grande.

Furthermore, one of the suits in question involves the title to the bed of the Cimarron River, a tributary of the Arkansas. The government would be clearly entitled to the undiminished waterflow in the Cimarron, if that should be necessary to maintain the navigability of the Arkansas "within the limits of present navigability"; but to hold that the Cimarron is navigable in a commercial sense would be contrary to the fact, would be of no benefit to the government in the exercise of its jurisdiction over navigable waters and would be unjust to the Indians to whom the government owes the duty of protection. It is understood the War Department does not hold that the Cimarron is a navigable stream. The State of Oklahoma and its lessees do make that contention, however, just as they contend that the Arkansas above the Grande is navigable.

It is not within the province of Congress to declare a stream to be navigable which is not so in fact, according to the test established by the Supreme Court, and Congress has not attempted to do so in this instance. The acts of Congress on the subject, taken as a whole, are to the contrary. Beginning in 1879, appropriations were made for improvement of the Arkansas up to Wichita, Kansas. This was done at the very earnest solicitation of enterprising citizens of Wichita and Arkansas City and upon incomplete data. The first work attempted by the War Department, on the upper river, very clearly demonstrated, what the records of the War Department have always shown, so far as this Department can find, that the Arkansas was not capable of being navigated above Grand River.

These appropriations continued until 1892, subject, however, to be expended by the Secretary of War in his discretion on the navigable portion of the river. In the memorandum of September 16, 1914, to which the Secretary refers in his letter as having been made for this Department, he says: "With the exception of the first item of appropriation these moneys were all expended on that section of the river between the mouth and Grand River." Reports of engineers and boards of engineers of the War Department who examined the Arkansas River in 1884, 1888, 1900 and 1910 all show the head of navigation to be at the mouth of Grand River. The

idea of making the Arkansas navigable above the Grand, if any such idea ever was seriously entertained by Congress, appears to have been long since definitely abandoned.

It appears doubtful, from the reports of War Department engineers, made by direction of Congress, whether the
 756 Arkansas above the Grand could be made practically navigable by the expenditure of any sum of money. But, however that may be, the possibility of a stream being made navigable has never been held by the Supreme Court to constitute navigability, with respect to federal jurisdiction over navigable water or the ownership of river beds. On the contrary, the rule established by many decisions of the Supreme Court is that, in order to hold a stream navigable it must be navigable in fact, and that depends upon whether, in its natural condition, it affords a channel for useful commerce of a substantial and permanent character.

In addition to the special engineers' reports above referred to, every annual report of the Chief of Engineers since 1903 to the Secretary of War, and by him reported to Congress, shows that the navigable portion of the Arkansas extends only to Grand River/

In the case of *Kansas vs. Colorado*, 206 U. S. 46, 86, wherein the navigability of the Arkansas was involved, the government intervened March 14, 1904, and relying mainly upon the records of the War Department, took the position which it now maintains in the River Bed cases in Oklahoma, namely, that "the Arkansas River is not now and never was practically navigable beyond Fort Gibson in the Indian Territory". Fort Gibson is on Grand River. The record of that case shows that engineers of the War Department assisted the Department of Justice to maintain the government's position as above stated/

In view of the foregoing, there appears to be no controlling necessity for the Secretary of War to maintain a decided stand in this matter. A passive attitude on his part would relieve this Department of present embarrassment and leave the War Department free to exercise its full jurisdiction in any possible future event/ The War Department letter of October 11, 1911, although not by any means conclusive, is entitled to consideration by the court as an executive decision on the question at issue, and may produce the erroneous impression that the government engineers, well known to be especially equipped to testify on questions concerning navigation, would testify against the government's contention,

particularly after an unsuccessful effort to have the latter revoked. It does not occur to us that it would impair the utility of the powers committed to the War Department even to recall the letter in question with a statement that the records of the Department show the head of navigation on the Arkansas to be at the mouth of Grand River. This would be merely a statement of fact, borne out by the records, which may speak for themselves. But, failing this, might not the Secretary with all propriety detail some competent official of the engineering bureau to make the examination of the records and testify concerning them, as suggested by the Attorney General in his letter to you of August 23rd, last? We think it quite important that the court should know the full contents of these records and not be left to surmise or presume that they may contain documents not produced. And might not the Secretary, in any event, then detail one or more engineers, experienced in work on navigable waters and well acquainted with the Arkansas, to make examinations as to present conditions and as to certain physical facts not sufficiently covered by former examinations for the purposes of these cases, and testify to the result? If called upon for expert opinions, they would have to qualify as individual experts, and such opinions would not in any respect be a reflection of departmental policy. The fact of their being government engineers would only bear upon their qualifications. It would have an important bearing inasmuch as it seems that few engineers in this country outside of the Engineer Corps have experience in matters concerning navigable rivers, and none outside of that corps have had any considerable experience on the Arkansas. This would give the Indians no advantage, as our adversaries would be equally entitled to avail of such testimony, and it would be very beneficial to the court in arriving at a decision. As I read his letter to you, the Secretary does not object to the employment of his experts if they are not called upon to explain the policy and opinion of his Department on the question at issue/

757 Since the receipt of your letter it has been ascertained that the cases probably will not be tried before November; so that the emergency which before existed is not now so pressing. The Attorney General is expected to return within ten days and, as this is a matter to which he had given

his personal attention, I suggest that executive action upon it may be deferred without prejudice until his return/

The Secretary's letter of August 26th is herewith returned.

Very respectfully,

(Signed) JOHN W. DAVIS,

Inclo 97765

Acting Attorney General.

(Plaintiff's Exhibit 85.)

The White House,
Washington,

September 7, 1915/

My dear Mr. Attorney General:

I thank you sincerely for your letter of September third about the River Bed cases in Oklahoma. I have taken the liberty of sending your letter to the Secretary of War accompanied by a letter of which I send you herewith a copy.

Cordially and sincerely yours,

(Signed) WOODROW WILSON/

Enc.

Hon. John W. Davis,
Acting Attorney General.

(Plaintiff's Exhibit 86.)

September 7, 1915/

My Dear Mr. Secretary:

I hope that you will give the enclosed your very serious consideration. This case seems to me of no small importance and what the Department of Justice requests does not seem to me to militate at all against the objection your department has in view as set forth in your recent letter to me. I would very much value your reconsideration of the matter.

Cordially and sincerely yours,

(Signed) WOODROW WILSON/

Enc/

Hon. Lindley M. Garrison,
Secretary of War.

758

(Plaintiff's Exhibit 87.)

War Department

Washington, September 30, 1915.

My Dear Mr. President:

On the 7th of September you transmitted to me a letter from the Acting attorney General (solicitor General Davis) about the navigability of the Arkansas River above the Grand River, and stated in your letter to me that what the Department of Justice requested did not seem to you to militate at all against the objection of my Department as set forth in my letter to you. You requested a reconsideration of the matter.

I have given the matter a most careful reconsideration and have caused it to be restudied by the Chief of Engineers and by the Judge Advocate General. I herewith inclose to you copies of the reports made to me by the Chief of Engineers and by the Judge Advocate General after such careful restudy of the whole matter.

It seems to me that these reports make perfectly clear the position which I had endeavored to make clear in my previous communications to the Department of Justice in this matter.

In the opinion of this Department, based upon the facts known to this Department and the records of this Department, we can only testify, if called upon to do so, that this portion of the Arkansas River is navigable. This being so, I cannot perceive any way in which we can properly aid the Department of Justice in any endeavor to prove that this portion of the river is not navigable. I need not assure you or the Department of Justice that the position which I have taken in this matter is not arbitrary, is not based upon any desire to sustain a position previously taken if upon restudy or re-examination such position was not properly based, and that if I could consistently do what the Department of Justice wants me to do I would gladly do so.

What the Department of Justice asks me to do is to detail engineers from the Corps of Engineers who will be competent to testify concerning the navigability of the Arkansas River at the locus in quo. As will be seen from the very careful review of the Chief of Engineers, every such officer, possessed of competency by reason of knowledge, is honestly convinced that the portion of the river in question is navigable, and, if detailed for the purpose of acting as a witness, would be compelled by his conscience to testify to that

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belief. Of course, I shall immediately comply with your suggestion of detailing officers of the Engineers Corps to act as witnesses in this case, if under all the circumstances the Attorney General determines that he desires to produce such testimony as they will be required to give.

Sincerely yours,

LINDLEY M. GARRISON.

The President,
Inclosures.

(Plaintiff's Exhibit 88.)

October 1, 1915/

The White House,
Washington,

My Dear Mr. Attorney General:

Oddly enough in view of our conversation of yesterday, the enclosed turned up that very day and I am sending it to you for your consideration. Apparently we are up against a stone wall so far as the War Department is concerned.

Always, Faithfully yours,

WOODROW WILSON.

Encs.

Hon. T. W. Gregory,
The Attorney General.

(Plaintiff's Exhibit 89.)

Department of Justice

Washington, D. C. October 30, 1915/

170648

Hon. Lindley M. Garrison,
Secretary of War.

My Dear Mr. Secretary:

Referring to your letter to the President dated September 30, 1915, in which you stated that you would detail officers of the Engineers Corps to act as witnesses in the River Bed cases if I should desire to produce such testimony as they

760 will be required to give, I have to request that you detail for that purpose Major E. M. Markham, in charge of the Little Rock office, and Asst. Engineer P. R. Van Frank, Jr., of the same office.

I should be pleased if you would immediately notify the two engineer officers mentioned, by telegram, to place themselves at the disposition of this Department for the purpose of making such examinations of the Arkansas River as may be required by the attorney in charge of these cases and to testify in the courts on the trial thereof as to the results of their examinations and any other material facts within their knowledge.

As the cases will soon be tried, please advice me at your earliest convenience of your action in the matter.

Faithfully yours,

T. W. GREGORY,
Attorney General.

(Plaintiff's Exhibit 90.)

War Department

Washington, DCK-LK

November 2, 1915.

The Honorable,
The Attorney General.

Sir:

In reply to your letter of October 30, 1915, requesting the detail of Major E. M. Markham, Corps of Engineers, and Assistant Engineer, P. R. Van Frank, Jr., to testify in the river bed cases of the Arkansas River, I have to inform you that a telegram has been sent this date to the district officer at Little Rock, Ark., directing that Assistant Engineer Van Frank be placed at the disposition of the Department of Justice to make such examinations of the Arkansas River as desired and to testify in court on the trial thereof.

No action had been taken in the matter of detailing Major Markham, since Major Markham is no longer in charge of the Little Rock office, having been relieved about a month ago by Major E. J. Dent, Corps of Engineers; it was thought probable that his detail would not be considered necessary.

However, if you still desire his detail, arrangements will be made therefor.

Very respectfully,

E. D. 79270/35

LINDLEY M. GARRISON,
Secretary of War.

761 Memorandum referred to in Exhibit 87 having been already introduced in connection with depositions of Chief of Engineers and Judge Advocate General, are not read a second time.

P. R. VAN FRANK, JR., recalled as a witness by the Government for further examination by Dr. Kearful, testified as follows:

Witness states that he received instructions through Major Dent to report to the Department of Justice. These instructions, he states, were in writing, embodied in a letter from the War Department, Office of the Chief of Engineers, Washington, November 2, 1915, from the Chief of Engineers of the U. S. Army to the District Engineer Officer, U. S. Engineers Office, Little Rock, Arkansas, marked exhibit 91 and read to the court, as follows:

(Plaintiff's Exhibit 91.)

War Department

DCK-LK

Office of the Chief of Engineers

From: The Chief of Engineers, U. S. Army. November 2 1915,

To: The District Engineer Officer, U. S. Engineer Office,
Little Rock, Ark.

Subject: Arkansas River.

1. The following telegram was sent you today:

Secretary of War directs that Assistant Engineer P. R. Van Frank, Jr., be placed at disposition of Department of Justice to make such examinations of Arkansas River as desired and to testify in court in trial thereof.

2. Mr. Van Frank should get in touch with the United States attorney in local charge of the Arkansas River case, and carry out so far as practicable the desires of the Department of Justice. It is understood that any expenses at-

tacked to this detail of Mr. Van Frank will be borne by the Department of Justice.

3. The War Department has had considerable correspondence with the Department of Justice in regard to the question of the navigability of the Arkansas River in Oklahoma, and Mr. Van Frank should make himself familiar with the views of the Department thereon. These views are set forth in a memorandum of September 16, 1914, from the Chief of Engineers to the Secretary of War; a memorandum of August 10, 1915, from the Chief of Engineers to the Secretary of War; a letter of August 12, 1915, from the Secretary of War to the Attorney General; and a memorandum of September, 10, 1915, from the Chief of Engineers to the Secretary of War. Copies of all the above papers were recently furnished your office.

By Command of the Chief of Engineers.

W. KELLY,

A true copy,
John M. Sears, Chief Clerk.

Major, Corps of Engineers.

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Cross-Examination

By Mr. Freeling:

Witness states that he made himself familiar with the attitude of the War Department as outlined in its letter, Exhibit No. 91, and that these views are set forth in the memorandum of September 16, 1914, from the Chief of Engineers, General Kingman, to the Secretary of War. The substance of this memorandum, witness states, is that the question of the determination of the navigability of the Arkansas River is a question for the courts to decide regardless of the acts or the opinion held by the War Department. Witness states that the position of the War Department to a large extent is based on the action of Congress. The memorandum of August 10, 1913, from the Chief of Engineers to the Secretary of War, witness states, is the memorandum in which the Chief objects to furnishing any employees of the Department to the service of the Attorney General. In this memorandum the Chief of Engineers states: "I strongly recommend that the detail of any officer or employee of the Engineer Department for the purpose of taking stream measurements of the Arkansas River to be used in the case to be tried in September, be not made." The substance of that memorandum, witness states, "is in reply to a request that the Chief of Engineers detail

some one to take measure of the flow of the Arkansas river once a week for three or four weeks beginning about August 15, for the purpose of obtaining data tending to establish the navigable statue of the stream. Now, then, the serious objection is from the Chief that within the three weeks time called for the individual detailed might not give reliable or dependable information, for, he says, it might happen that the river was in an exceedingly low stage, medium stage, or a very high stage; to obtain information of any value whatever as to the flow of the river the observations should be extended over a period of years, not of days." In reply to the question as to whether he agreed with that, witness states that it was not a question of agreeing with it or not, but it is a pretty good statement of fact. He states that he direct observation as to the stream flow need not extend over a period of years if you have any other way of comparing the stages for a period of years. So far as taking a
 763 few measurements without any other information, witness states that the statement of the Chief of Engineers is correct.

The substance of the letter of August 12, 1915, from the Secretary of War to the Attorney General, referred to in Exhibit 91, witness states is simply a repetition of the other one in a different form and quotes two paragraphs of the other verbatim. The memorandum of September 10, 1913, from the Chief of Engineers to the Secretary of War is one treating in general terms the navigability of streams—briefly, that it might be divided in two divisions; one division seeming to treat on the idea that the river need not be navigated continuously to be a navigable waterway. The other part witness states, seems to be that because of Congress having made several appropriations for the improvement of the river to Wichita that the War Department necessarily consider it a navigable waterway.

The witness was here asked the following questions, to which he made the following answers:

Q. Well, haven't they always maintained that view ever since you have been with the Department, that it is a navigable river of the United States, and treated it as such?
 A. They have a peculiar way of expressing that. They say that by reason of the Congressional appropriations, the War Department exercises jurisdiction and control over the river to Wichita, Kansas.

Q. Don't you know that if it wasn't a navigable stream the United States wouldn't have jurisdiction over it within the borders of a state?

A. Well, I don't know. That peculiar expression very generally used has been with a view it seems to me to not bring the word navigability and not to use it in that sense as expressing actual navigation. It has only been really since this trouble commenced that the War Department has stated plainly specifically that its holding is that it is a navigable waterway to Wichita, Kansas, in the sense it is actually navigable.

764 Q. Before this trouble, as we call it, there wasn't any occasion for any different holding before that, was there? This is the first time its navigability has been questioned, is it not?

A. It is the first time it has been questioned in public.

Q. Well, in a legal sense. A. Yes.

Q. First time its navigability has ever been challenged in a court of justice, is it not, in opposition to the United States?

A. Well, it is the first I know of. Of course there may have been other cases.

Q. You don't know of any place where the government has ever asserted before that it is a non-navigable stream, do you. A. No sir."

Witness states that he is assistant engineer to the district engineer officer, Major E. J. Dent, at Little Rock, Arkansas and that he had received instructions to familiarize himself with the views of the War Department. He states that no employes, no subordinate of the War Department can express an opinion that either substantiates or puts in issue any settled conclusion of that department. These instructions he states are contained in the correspondence that was furnished the office and in the letter which he has read. Witness states that other than Mr. Kearful, no Special Agent of the Department of Justice has been to see him in regard to the navigability of the Arkansas, and that he has done his work under the instructions received in the letter referred to dated November 2, 1915, exhibit 91.

765 Here the defendants, the State of Oklahoma and its lessees, offered in evidence the caption and the first paragraph of the bill of complaint, in equity, suit No. 1733, United States of America, complainant, vs. Phillip Mackey, et al., defendants, reading:

"In the United States District Court for the Eastern District of Oklahoma. United States of America, Complainant, vs. Phillip Mackey, Mary Mackey, Lovely Mackey for Himself and as Guardian of Phillip Mackey and Mary Mackey, Minors, Cyrus S. Avery, The Waterside Oil and Gas Company, a Corporation; Gypsy Oil Company, a corporation and Texas Pipe Line Company, a corporation, Defendants. Equity No. 1733.

Bill of Complaint.

The United States of America by William J. Gregg, United States Attorney for the Eastern District of Oklahoma by direction of the Honorable George W. Wickersham, Attorney General of the United States, presents this its bill in its own behalf for and on behalf of the Creek Nation of Indians in the State of Oklahoma, against Phillip Mackey, Mary Mackey, Lovely Mackey, for himself and as guardian of said Phillip Mackey and Mary Mackey, minors, who are residents of Muskogee, Muskogee County, Oklahoma, and citizens of said state; Cyrus S. Avery, a resident of Tulsa, Tulsa County, Oklahoma, and a citizen of said state; The Gypsy Oil Company, a corporation, duly organized and existing under the laws of the State of Oklahoma and a citizen of said state, having its principal place of business in the City of Tulsa, Tulsa County, within the Eastern, Judicial District of said state; the Waterside Oil and Gas Company, a corporation, duly organized and existing under the laws of the State of Oklahoma and a citizen of said state and having its place of business in the City of Tulsa, Tulsa County, within the Eastern Judicial District of said state; and the Texas Pipe Line Company, a corporation, duly organized and existing under the laws of the State of Texas and having authority to do business in the State of Oklahoma, and a resident of the State of Texas, and thereupon your orator complains and says:"

The defendants, the State of Oklahoma and its lessees, here introduced in evidence a paragraph from the answer of the complainant, the United States of America, in said equity suit No. 1733, styled United States of America vs. Phillip Mackey, et al., in which paragraph appears the following:

"Complainant admits that the Arkansas River is a meandered stream and alleges that said Arkansas River is a navigable stream."

The United States of America then offered in evidence the following, appearing on pages 119-120 in brief on behalf of appellants, United States of America, in cause No. 4093 in United States Circuit Court of Appeals for the Eighth Circuit, styled United States of America, appellant, vs. Phillip Mackey, et al., appellees, being the appeal from the judgment rendered by the United States District Court for the Eastern District of Oklahoma in said cause No. 1733, equity, styled United States of America, complainant, vs. Phillip Mackey, et al., and reading:

“The question presented for decision below arose, as we have explained in the Statement of the Issues, ante, on demurrers to the government’s bill and on demurrers in the cross-bill of the defendants Gladys Belle Oil Company, Gypsy Oil Company, Charles Stunkard and Walter Stunkard. Neither the bill nor the cross-bill contained any averment concerning the navigability or non-navigability of the river; and the demurrers, of course, supplied nothing the bill and cross-bill did not contain.

It is true, and should be remarked here, that in the government’s answer to the cross-bill, counsel then representing the government asserted that ‘said Arkansas River is a navigable stream,’ but this assertion was inadvisedly and inadvertently made, is in contradiction to the government’s position, and will be withdrawn if, and as soon as, the decree is reversed and this cause remanded. Of course the assertion had no influence on the trial court, because the pleading in which it was thus inadvertently made had never come before him, has never yet come before him. It is not even in the transcript of the record on this appeal, because not pertinent to any question presented, the government’s whole case having been finally disposed of on the bill of complaint and the demurrers thereto. The point would have no materiality here, were it not that on page 9 of their brief in Appeal No. 4037, counsel for Pollard-Hagan Oil Company have referred without explanation to the assertion above quoted, thus causing it to appear that we endorse their own direct and strenuous charge of navigability. Because of this, we desired to acquaint this court with the true condition of the pleadings.

The bill, then, and the cross-bill, contained not a single word as to the navigability or non-navigability of the Arkansas River. There was no evidence adduced by any of the parties. And so it is plain that in order for the trial court to ‘start with the proposition that the Arkansas River is a navigable stream,’ he must have

taken judicial notice of the fact of its navigability. Let us inquire whether in doing so he kept within established principles of law."

767 And thereupon, and on to-wit: November 28, 1916, Honorable F. J. Kearful, Special Assistant to the Attorney General of the United States, one of the Solicitors herein for complainant, the United States of America, addressed to the Honorable John H. Cotteral, Judge of the United States Court for the Western District of Oklahoma, the following letter, to-wit:

"November 28, 1916.

"Hon. John H. Cotteral,
Guthrie, Oklahoma.

Dear Judge Cotteral:

Herewith inclosed I am sending certified copies of the following: Two letters from the Secretary of War to the Attorney General dated November 24, 1916, and one letter from the Attorney General to the Secretary of War dated October 20, 1916.

The subject of these letters is the question of the navigability of the Arkansas River above the mouth of the Grand River, and they are sent to you for your information and such consideration as you may deem proper in connection with the River Bed Cases (equity Nos. 75 and 839), pending in the United States District Court for the Western District of Oklahoma and now under consideration by you.

By the same mail I am sending to the United States Attorney at Oklahoma City six copies of this letter, together with its inclosures as above stated, with the request that he send them to the various attorneys who appeared on the trial of these cases.

Very respectfully,

F. J. KEARFUL,
Special Assistant to the Attorney General,
Attorney in the case."

768 in which letter was enclosed, for consideration by the court in this cause, the following letters from the Sec-

retary of War, addressed to the Attorney General of the United States, to-wit:

“War Department.

Washington, November 24, 1916.

“My Dear Mr. Attorney General:

In the accompanying letter I have expressed it as my judgment that the records of this Department show that the head of navigation on the Arkansas River is at the mouth of the Grand.

I have not undertaken, however, to [“rovoke”] the letter from this Department of October 11, 1911, signed by Assistant and Acting Secretary Oliver, since I feel that that course would be less orderly and less advisable from an administrative standpoint.

Cordially yours,

NEWTON D. BAKER,
Secretary of War.”

“War Department,

Washington, November 24, 1916.

“The Attorney General,

Sir:

In response to your letter of the 20th ultimo, I have the honor to state that in my judgment the records of this Department show the head of navigation on the Arkansas River to be at the mouth of the Grand River, and that the Arkansas River is non-navigable in fact above that point.

Very respectfully,

NEWTON D. BAKER,
Secretary of War.”

769 which said letters from the Secretary of War to the Attorney General, dated November 24, 1916, were responsive and in answer to an official communication from the

Attorney General to the Secretary of War under date of October 20, 1916, as follows, to-wit:

“October 20, 1916.

“My dear Mr. Secretary:

On November 17, 1915, I addressed to your predecessor a letter to which I earnestly invited his personal attention. Receipt of the letter was acknowledged on November 23rd following, with the statement that it would be given his personal attention, but it has never been acted on.

The purpose of my letter was to persuade the Secretary to reverse his attitude with respect to the navigability of the Arkansas River. He has held the Arkansas to be a navigable water of the United States above its junction with Grand River, and this holding was contrary to the position taken by the Government in certain suits in Oklahoma known as the River Bed cases. These suits were instituted on the request of the Secretary of the Interior and their object is to establish the title of the Creek and Osage Indians to the bed of the Arkansas River in the Creek country and where it bounds the Osage country. The section of the stream in question lies above the mouth of Grand River, and the principal basis of the government's claim on behalf of the Indians is that the stream is not navigable above that point. The claim of our adversaries, the State of Oklahoma and its lessee oil companies, that the title to the river bed vested in the State upon its admission to the Union, is founded solely on the contention that the Arkansas River in this section is navigable.

In a letter dated October 11, 1911, addressed to the Attorney General and signed by Acting Secretary of War Oliver, referring to the Arkansas River where it bounds the
770 Osage country, it was said that

it appears from a report of the engineer authorities that said river at the locality mentioned is a navigable waterway within the purview of laws enacted by Congress for the preservation and protection of such waters and of decisions of the Supreme Court of the United States on the subject, and the department has uniformly so held.

This letter fell into the hands of our adversaries and on it and the Secretary's adherence to it they mainly rely to establish their claim. Convinced after a thorough investigation that this statement was not in harmony with the decisions of the Supreme Court and the records of the War Department, I brought the matter to the personal attention of the Secretary of War, and asked for a reconsideration. But the Secretary

upon the advice of his subordinates, adhered to the statement of Acting Secretary Oliver. I then requested the detail of engineer officers to examine the river and testify in court to its physical characteristics. This was refused. Thereupon I requested the detail of some officer of the War Department having full knowledge of the matter to testify to the facts and reasons relied on to support the view of that Department. This also was refused. The matter was then laid before the President who wrote to the Secretary on August 25, 1915, expressing his opinion that the latter had made 'a serious mistake' and requesting him to 'lend the utmost assistance to the Department of Justice in this extremely important case'. The Secretary in a letter to the President dated August 26, 1915, declined to admit that he had made a mistake and declined to assist the Department of Justice as requested, stating his reasons therefor at some length. This letter was sent to me by the President on August 28, 1915, with the request that I give my 'view of the case as presented by the Secretary.' In my absence the Solicitor General responded by letter to the President dated September 3, 1915, in which it was shown, in the most convincing fashion, I think, that the views
771 advocated by the Secretary's advisers, and expressed
 in his letter, concerning the legal test of navigability,
 concerning the decisions of the Supreme Court on this
subject, and concerning the effect of certain acts of Congress
making appropriations for improvement of the Arkansas
River, were based on misconception.

In addition to this it was pointed out by the Solicitor General that the records of the War Department, consisting of reports of engineers and boards of engineers made after examinations of the river, concurred in by the Chief of Engineers and reported to Congress, had always shown that the navigable portion of the Arkansas River extends only to the Grand River; and that in the case of Kansas vs. Colorado, 206 U. S. 46, 86, 115-117, whereon the navigability of the Arkansas was involved, the government intervened on March 14, 1904, and, relying mainly upon the records of the War Department and the testimony of the War Department engineers, took and successfully maintained the identical position which it now holds in the River Bed cases. It was further pointed out by the Solicitor General that the War Department letter of October 11, 1911, holding the Arkansas River to be a navigable waterway in the vicinity of the Osage country, and in the hands of our adversaries, would be entitled to consideration by the court as an executive decision on the question at issue and might 'produce the erroneous impression

that the government engineers, well known to be especially equipped to testify on questions concerning navigation, would testify against the Government's contention'. On this account the Solicitor General suggested that the Secretary might relieve this department of embarrassment, without impairing the lawful jurisdiction of the War Department over navigable waters, by recalling the letter in question 'with a statement that the records of the War Department show the head of navigation on the Arkansas to be at the mouth of Grand River.' Failing this, it was suggested that the Secretary might with all propriety 'detail some competent official of the Engineering Bureau to make an examination of the

772 records and testify concerning them,' in order that the court might 'not be left to surprise or presume that they may contain documents not produced'. In any event it was further suggested that the Secretary might 'detail one or more engineers experienced in work on navigable waters and well acquainted with the Arkansas to make examinations as to present conditions and as to certain physical facts not sufficiently covered by former examinations for the purposes of these cases and testify to the result.' The difficulty and inadvisability of procuring private engineers for this purpose was also shown.

This letter of the Solicitor General was sent by the President to the Secretary by letter dated September 7, 1915, in which he wrote:

I hope that you will give the inclose your very serious consideration. This case seems to me of no small importance and what the Department of Justice requests does not seem to me to militate at all against the objection your Department has in view as set forth in your recent letter to me. I would very much value your reconsideration of the matter.

The Secretary responded by letter to the President dated September 30, 1915, inclosing memoranda furnished by the Chief of Engineers and the Judge Advocate General in support of his previous position, which he again adhered to. By letter dated October 1, 1915, the President sent the Secretary's letter and its accompanying memoranda to me for my consideration, with the remark: 'Apparently we are up against a stone wall so far as the War Department is concerned.'

Upon consideration of the Memoranda furnished by the Secretary's advisers it was very clear to me that their conclusions were founded upon a mistaken view of the law and

positive misinformation as to the facts touching this subject.

“The Judge Advocate General in this memorandum said, in substance, that a stream is navigable for purposes of Federal jurisdiction if it can be made navigable by artificial aid and improvement. The correct rule established by many decisions of the Federal courts—and I have discovered none to the contrary—is that a stream is navigable for purposes of Federal jurisdiction when is it navigable in fact; that it is navigable in fact when, in its natural condition and without the aid of artificial means, it affords a channel for useful commerce in the customary modes of trade and travel on water, and that a theoretical or potential navigability, or one that is temporary, precarious and unprofitable is not sufficient.

Harrison vs. Fite, 148 Fed., 781, 783-784. The Daniel Ball, 10 Wall. 557, 563. The Montello, 20 Wall., 430, 441, 443. United States vs. Rio Grande Irr. Co. 174 U. S. 690, 699. Leovy vs. United States, 177 U. S. 621, 632-634. Donnelly vs. United States, 228 U. S. 243, 262, 708. People vs. Economy Power Co., 241 Ill. 290; 329; 234 U. S. 497, 522.

“The Judge Advocate General also referred to certain appropriations made by Congress for improvement of the Arkansas River, available to Wichita, Kansas, as amounting to a Congressional determination that the Arkansas River is navigable to that point. Congress has not the power to declare a stream navigable which is not so in fact, according to the test established by the supreme Court, and it did not attempt to do so in this instance. Rightly considered these appropriation acts should be accorded the contrary effect. They began in 1897 and ceased in 1890. The first work of improvement attempted by the War Department above the Grand was the operation of the snag boat Wichita, ‘designed especially for work upon this reach.’ It drew ‘some 14 inches of water and was furnished with good appliances for dragging over shoal places.’ No serious difficulties were encountered until the mouth of the Grand was passed. From there on the daily entries in the log book of Captain Joseph Evins who operated the boat and his weekly reports compose a continuous record of dragging and sparring over sand bars and waiting for water.’ For seven months this boat was in the upper reach of the river, never being able to get above the Pawnee Agency landing in Indian Territory or back to Fort Gibson.’ (H. Ex. Doc. No. 90, 40th Cong. 1st

sess. P. 12; Ann. Rep. Chief of Engineers for 1883, p. v.)
 Although the appropriations continued until 1890
 774 available to Wichita, all of them except the first were
 expended below the Grand. The information afforded
 by the operation of the snag boat, together with subsequent
 surveys and examinations by engineers and Boards of En-
 gineers, made by direction of Congress, demonstrated that
 the Arkansas could not be navigated above the Grand, and
 the project was then definitely abandoned.

"The Judge Advocate General also said in his memor-
 andum for the Secretary of War: 'Kansas vs. Colorado did
 not involve the question of navigability of the Arkansas in
 Kansas'.

"The record in that case in the Supreme Court shows that
 the State of Kansas alleged in its amended bill (Record p.
 63):

The river in its course, after leaving the mountains, is a
 navigable stream under the laws and departmental rules and
 regulations of the United States.

"And again (p. 67):

Said river from its mouth at the Mississippi river to the
 Colorado line became, was, is and always has been treated as
 a navigable river.

"The State of Colorado denied this allegation and alleged
 (p. 80):

That said river is not navigable within either the State of
 Colorado or the State of Kansas.

"And again (p. 85):

This defendant again denies that the said Arkansas River
 is now, or at any time has been, a navigable river in the State
 of Kansas or that it has at any time been treated as such.

"The petition of intervention of the United States alleged
 (p. 235):

That said stream is not navigable in the States of Colorado
 and Kansas and the Territory of Oklahoma, but is navigable
 in the State of Arkansas and in the Indian Territory.

"This issue was contested by the State of Kansas on one
 side and the State of Colorado and the United States on the
 other. Over 1,000 pages of printed testimony were taken up-

on this issue and many public documents, including records of the War Department, were introduced. Many pages of the briefs were devoted to its discussion, the government's
775 brief on that point covering 58 pages. On page 53 of the government's brief it was said:

The testimony submitted by the intervenor shows conclusively that the Arkansas river never was and can not be made practically navigable above Fort Gibson, in the Indian Territory.

* * * All the witnesses called by the intervenor who [testify] in regard to this question were men of practical experience in the navigation of boats on said river, or were government officers and engineers whose duty it was to make a study of the question of the navigability of said stream.

"The Supreme Court accepted the position taken by the [government] as correct, without discussion of the evidence, and, as between Kansas and Colorado, decided against Kansas on the evidence (306 U. S. 46, 86, 115-117).

"The Judge advocate General cited the decision of the Supreme Court of Kansas in Hurst vs. Dana, 122 Pac., 1041, and State vs. Akers, 140 Pac., 637, as 'holding that the Arkansas is navigable in Kansas.'

"The cases cited do not hold that the Arkansas is navigable in Kansas but hold the contrary. The second case depended on the first, and in that case the court said; 'It is not pretended that the river is now navigated or navigable in fact in Kansas, and the court, as well as everybody else, knows that it is not.' It was conceded that 'to hold that this stream is navigable is equivalent to ruling that sand may be navigated.' What the court did was to take judicial notice of ancient historical data supposed to show the navigability of the stream 'in days gone by', and proceeding, by the way, utterly without foundation in fact. Even if the Kansas court had been justified in its arbitrary finding of ancient navigability, such finding would lend no support to the present contention of Oklahoma that the Arkansas was navigable above the Grand on November 16, 1907, the date of the admission of Oklahoma to statehood. (See Harrison vs. Fite, 148 Fed., 781, 784.)

"Again the Judge Advocate General said in his memorandum:

776 It is the view of the Chief of Engineers, the immediate custodian of the records and the head of the technical bureau dealing with matters of navigable waters, that the rec-

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ords do not indicate that the head of navigation is at the mouth of Grand River.

"The Chief of Engineers, in his own annual report on the Arkansas River for 1914, stated at page 896:

The general project for improvement covers the navigable portion extending from the mouth of the river to the mouth of Neosho (Grand) River, 461 miles.

"The Chief of Engineers in his annual report for 1903, page 378, said:

Fort Gibson, on the Grand River, 2 miles above its mouth, and 463 miles from the mouth of the Arkansas River, is the head of navigation.

"This statement was repeated by the Chief of Engineers in every annual report from 1903 to the present.

"I presume that the most convincing records on this point would be those showing actual commerce on the river, or the lack of it, and the reports of engineer officers made after examinations of the section in question. All of these are to the same effect. They not only indicate but thoroughly demonstrate that the head of navigation on the Arkansas is at the mouth of the Grand. The principal ones are, briefly stated, as follows:

"Report of Col. Long of the Topographical Engineers, dated December 29, 1853, (Sen. Ex. Doc. No. 26, 33d. Cong. 1st Session):

The Arkansas is navigable only to the junction of the three forks distinguished by the names of the Arkansas, Verdigris and Neosho.

"Report of Engineer F. S. Burrows upon a survey of this section of the Arkansas, dated November 6, 1884 (House Ex. Doc. 90, 49th Cong., 1st session, pp. 8, 15):

In the discussion of the river with reference to its general hydrographic features—that is, depth, oscillation, character of bed and banks, obstructions both natural and artificial, the general feasibility, desirability, and [probably] cost of making successful navigation possible throughout the whole or any part of the river embraced in this survey—it should be

borne in mind that no portion of it is at present or has ever been considered navigable. The mouth of Grand River is now considered the head of navigation, al

though, in fact, the commerce of the river for 40 miles below this point is practically nil.

Any scheme for making this portion of the river navigable would necessarily include some plan of improvement which would make navigation practicable at a very low stage, as the floods are of such short duration and so uncertain as to date of arrival that neither shippers nor steamboat owners could depend on them.

The mouth of Grand River is at present regarded as the head of navigation, but the traffic for a distance of 94 miles below that point—that is, to Fort Smith—is very light, being generally carried by one small boat, making irregular trips during four or five months in the year.

“Report of a board of five engineers, dated March 16, 1888 (H. Ex. Doc. No. 234, 50th Cong. 1st Session, p. 7), referring to a section reaching down to the Canadian 41 miles below Grand:

The commerce over this section of the river is and always has been practically nothing.

In view of the small low water flow in this section * * * the board is of opinion that the cost of any general improvement by contraction works of this section which aimed at obtaining even as much as 2 feet at low water would far exceed the value of the resulting advantages.

“Report of a board of three engineers dated November 23, 1900, (H. Doc. No. 150, 56 Cong., 2nd session, pp. 5, 13):

Fort Gibson, on the Grand River, 2 miles from its mouth and 463 miles from the mouth of the Arkansas River, has always been considered the head of river navigation * * * - The slope of the river undergoes an abrupt change at the Grand River. Above that point, or the 82 miles to the Cimarron, the average slope is 2 feet per mile. Below the Grand the slope is but 1.2 per mile in the first 37 miles, and diminishes from there on.

As before stated, the mouth of the Grand River has always been considered the head of navigation on the Arkansas River. Attempts at navigation on the river above that point have been of rare occurrence and soon abandoned.

“Report of Major M. L. Walker on a section of 65 miles of the Arkansas, from the mouth of the Grand up to Tulsa, dated June 19, 1909, approved by the Board of Engineers for Rivers

and Harbors and by the Chief of Engineers (House Doc. No. 206, 61st Cong. 2nd Session, pp. 4-7):

The steep slope, the small low water flow, and the shifting sands and gravel in the bed of the river preclude any possibility of improving it by means of regulation works so
778 as to afford a channel that would be of any worth for navigation purposes * * *

The mouth of Grand River has always been considered as the head of navigation on the Arkansas River, and if there has ever been any commercial navigation of any sort above that point this office has no information of it * * *

In view of the foregoing and in compliance with the law directing that an opinion as to the worthiness of an improvement be expressed, I must report that it is my opinion that the Arkansas River between Tulsa and the mouth of Grand River is not worthy of improvement.

“The Chief of Engineers, in his memorandum for the Secretary of War, said:

In the report of the Chief of Engineers for 1885, on page 1611, it says: ‘During the latter part of the fiscal year a steel steamer with a fleet of five steel barges none drawing over 12 inches of water has been put on the river from Arkansas City to Fort Gibson.’

“The statement quoted was not made by the Chief of Engineers but by Capt. H. S. Taber, the officer then in charge of the Little Rock Office, and was disregarded by the Chief in his annual report. If any such fleet was ever ‘put on the river from Arkansas City to Fort Gibson’, it was promptly taken off again as a failure, inasmuch as all the reports show that there never was any commercial navigation on that section. This was evidently one of the many reckless statements made on hearsay by Capt. Taber, who appears to have known little about the upper Arkansas and was much influenced by enterprising citizens of Wichita and Arkansas City. Although he further stated his belief that ‘this boat is destined to produce a revolution in the matter of navigating the upper reaches of shallow waters,’ he does not mention it again, and the records of the Little Rock office and the War Department show that it was sold to the Government soon afterwards for use as a towboat on the river in the State of Arkansas.

"The most disquieting statement in the Secretary's last letter to the President was the following:

What the Department of Justice asks me to do is to detail engineers from the Corps of Engineers who will be competent to testify concerning the navigability of the Arkansas River at the locus in quo. As will be seen from the very careful review of the Chief of Engineers, every such officer, possessed of competency by reason of knowledge, is honestly convinced that the portion of the river in question is navigable, and, if detailed for the purpose of acting as a witness, would be compelled by his conscience to testify to that belief.

"This was founded upon the following statement in the memorandum of the Judge Advocate General, referring to engineer officers who had been in charge of the Arkansas River.

The Chief of Engineers has communicated with all such officers who are now accessible and they have notified the Chief of Engineers that from their knowledge of the river they would have to testify that it is navigable.

"The Chief of Engineers attached to his memorandum 'a list of the officers which have been connected with the improvement of the Arkansas River since 1875' and said that 'among them will undoubtedly be found the ones best capable to testify from personal knowledge as to its character.' In the list of those indicated as available were the names of Lieutenant (now General) W. L. Sibert, in charge of the Arkansas River from August 16, 1894, to September 14, 1898, and Major M. L. Walker, in charge of the river from December 7, 1908, to September 19, 1910.

"The leading counsel for our adversaries in the River Bed cases discovered the memoranda in question and, [emblodened] by the statements just referred to, proposed to bring General Sibert and Major Walker to Washington to give their depositions. To this I readily assented. The depositions were taken in the War Department on December 2 and 3, 1915, a few days before the trial of the cases at Oklahoma City. The pertinent portions of General Sibert's testimony are abstracted as follows:

During my service as officer in charge of the engineer office at Little Rock I had occasion to acquire data with reference to the navigability of the Arkansas River, as to the point at which navigation would cease, and as to attempts at naviga-

tion of the upper Arkansas. I never knew of any practical use of the Arkansas River for navigation above the mouth of the Grand. What was considered as the head of navigation by steamboat operators and government engineers. It could not be practically used for commerce above that point. More water came out of the Grand than the Arkansas at the point where the Grand entered. Rises were of short duration

780 and could not be relied upon to occur at expected times.

The thread of the current during high water does not follow the same line that it does during low water, with the result that it attacks the works of contraction and of regulation. It also fills up the crossing during high water. The bed of the Arkansas is composed of shifting sand and gravel, making the position of the deepest water uncertain. The channel changes from one side of the river to the other. Changes come very rapidly, especially at the crossings, being that part of the river which connects the bends. If rock foundation is available above the Grand, locks and dams could be built. It is simply a question of money. If fixed dams were built the pools would fill up with the moving sand. With movable dams, the shifting of the channel would be such as to leave a lock on the bar side of the river at one time and on the bend side at another. I would not recommend a system of locks and dams as a feasible method of providing a channel for useful navigation above the mouth of the Grand. I have never seen any report by an engineer officer or board, after examination of the Arkansas, which placed the head of navigation above the mouth of the Grand. My understanding of the term 'head of navigation' is the point at which practical navigation ceases. By 'practical navigation' I mean a navigation that can be relied upon to justify or cause its use by the people in the transportation of products. I do not say it is impossible to render the Arkansas available for navigation from Wichita, Kansas, to the mouth of the Grand. There is nothing impossible; that is, we could make some character of navigation on anything if we had money enough. We could build a canal from Tulsa to the mouth of the Grand, and turn the Arkansas River in it, and filter the water before it got in it, and make a navigable route. I would not undertake to say at what point on the Arkansas the jurisdiction of the United States over the same as a navigable stream ceases. I believe that the Arkansas as a navigable stream in fact ends at the mouth of the Grand. Above that point the small amount of water in it and the character of its channel, its bed and banks, cause it to be such a river that, in my opinion, it could not be made navigable in fact to the extent of justify-

ing its regular or periodic use by the people in the transportation of commodities. I refer especially to the character of stream that would result from any expenditure. If you could make a canal with concrete bottom and sides and filter the water in it, it could be navigated. Question by opposing counsel: 'Well, you could make a canal in the bed of the stream could you not?' Answer: 'I would rather make it on the bank.' As to the feasibility of floating logs down the Arkansas above the mouth of the Grand, my opinion is that such logs, either singly or in raft, would ordinarily be landed on sand bars. The shifting channel and its violent changes of direction within the broad channel itself is such as to make such navigation impracticable.

"The testimony of Major Walker is in harmony with that of General Sibert, although the former knew very little about the river. The same may be said of the testimony of the Chief of Engineers. He had no personal knowledge of the river above Little Rock, and the statements in the engineer reports hereinbefore referred to, including his own, which fix
781 the head of navigation on the Arkansas at the Grand, apparently had not come to his attention. He had never seen nor heard of them or any of them. He did indeed give his opinion that the Arkansas is a navigable stream above the Grand. His reasons for this are best stated in his own language, as follows:

I consider the upper part of a stream which can not be navigated a navigable stream because the lower part of it is navigated and a navigable stream. I consider it navigable water of the United States undoubtedly. We could not draw the line there. I hold that the entire stream is navigable, because the waters of the upper stream are necessary to give water to the lower portion. I consider there are navigable streams and non-navigable streams, but that we can not cut them in two and cut them in pieces.

"In order to expose the fallacy of this reasoning I need only to quote from the Solicitor General's letter of September 3, 1915, to the President, the following:

The lower Rio Grande is a navigable stream. Of this the Supreme Court took judicial notice in the case of the United States vs. Rio Grande Irrigation Co., 174 U. S. 690, 698. But the court also held (p. 699), upon consideration of the evidence, that the upper Rio Grande, within the limits of New Mexico, is not a navigable stream, because as the court said: 'The Rio Grande within the limits of New Mexico is not a

stream over which in its ordinary condition trade and travel can be conducted in the customary modes of trade and travel on water. Its use for any purposes of transportation has been and is exceptional, and only in times of temporary high water. The ordinary flow of water is insufficient.' Nevertheless, the courts sustained the right of the Attorney General to protect the navigability of the lower river by proceedings to restrain the appropriation of water in the upper portion, to the same extent that he would have the right to protect any navigable waterway by suit to restrain the appropriation of water in its non-navigable tributaries. (p. 709). The court thereupon directed (p. 710) 'an inquiry into the question whether the intended acts of the defendants in the construction of a dam and in the appropriation of the waters of the Rio Grande will substantially diminish the navigability of that stream within the limits of present navigability, and if so, to enter a decree restraining those acts to the extent that they will so diminish.'

The result of the decision in the Rio Grande case is that the State of New Mexico can have no claim of title to the bed of the Rio Grande within the State, but that such title pertains to the individual [proprietors] along the banks. Indians in that position are clearly entitled to the protection of the government in their ownership of the bed of the upper Rio Grande, while the government is equally entitled to the undiminished waterflow thereof, if necessary, to protect the navigability of the lower Rio Grande. The present case of the Arkansas is exactly parallel in this respect to the case of the Rio Grande.

782 "On the trial of the cases at Oklahoma City in December, 1915, the principal assistant engineer in the United States engineer office at Little Rock for the past 24 years, and who evidently knows more about the Arkansas River than any other person, corroborated in all respects the testimony of General Sibert. In addition there was adduced the testimony of a number of boatmen and pilots, with experience on the Arkansas River in recent years and as far back as 1855. They had attempted to establish navigation on the Arkansas above the Grand, under circumstances calling for their best and most earnest efforts, and all had signally failed. They all testified from their experience as practical boatmen with light craft and rafts on the river, that it could not be used for any commercial purpose above the mouth of the Grand, even at times of high water. There was no testimony to the contrary. The ruling of the War

Department was our opponents' main reliance. The letter of Acting Secretary of War Oliver, dated October 11, 1911, which states that the Arkansas in the vicinity of the Osage country is a navigable waterway of the United States and that the Department has uniformly so held, was offered in evidence and received over our objection. Obviously then, in self defence, we were forced to introduce the whole of the correspondence between the Departments and to read the deposition taken in the War Department. In this situation, we could not do otherwise than contend, as we did in our brief, that—

The War Department holding that the Arkansas above the Grand is a navigable water of the United States is not supported by the records of that Department, or by any fact, reason or authority, and is therefore without any probative force.

“Judge Cotteral, before whom the cases were tried at Oklahoma City, has not yet rendered a decision. The other cases pending in the eastern district of Oklahoma involving the same question are to be tried before Judge Campbell at Muskogee in November. The same situation will arise and the same contention will have to be made then as before, and again in the Circuit Court of Appeals and in
783 the Supreme Court, unless the ruling of the War Department should be reversed.

“Such an apparent conflict between the Departments is very embarrassing in any case. It becomes more so now since our opponents will argue that, inasmuch as there has been a change in the office of Secretary of War without any change of ruling on this subject, it is to be presumed that the present Secretary concurs in the ruling of his predecessor.

“In my letter of November 17, 1915, to your predecessor, which remains unanswered, I suggested that it would be sufficient to recall your departmental letter of October 11, 1911, ‘with a statement that in view of the pending litigation, the War Department desires to assume a neutral attitude and that the records of the Department may speak for themselves.’ But that letter was written before the trial and before the War Department depositions were taken. On this account—in view of what transpired afterwards—a simple statement of neutrality would not now do full justice to the situation. I therefore have the honor to suggest that, in the light of the foregoing, you may perhaps see your way

clear to revoke the letter of October 11, 1911, with the statement that the records of the War Department show the head of navigation on the Arkansas River to be at the mouth of the Grand River, and that the Department holds the Arkansas River non-navigable above that point.

Cordially yours,

(Signed)

T. W. GREGORY,
Attorney General.

784 The Secretary of War.

P. S. Copies of the depositions referred to in this letter can be procured for your perusal if you desire them. T. W. G."

Copies of all of the above letters were furnished to each of the attorneys appearing of record herein as counsel for the defendants or interveners.

785 As soon as copies of said letters were received by counsel for defendants and interveners, the said counsel for defendants and interveners wrote a letter to the Honorable John H. Cotteral Judge of United States District Court for the Western District of Oklahoma (a copy of which was seasonably furnished the attorneys for the United States of America in this cause), objecting to the consideration by the court of said letters or any of them because, first: This case had been submitted for many months and had been under consideration by the court for many months prior to the 28th day of November 1916, Second: Because said letters and each of them were self serving declarations. Third: Because said letters written by the Honorable Newton D. Baker, Secretary of War to the Attorney General were written before the said Secretary of War had been in office a sufficient length of time in order to acquaint himself with what the records of the War Department show to be the head of navigation on the Arkansas River, and as to whether or not the Arkansas River is navigable in fact above the mouth of the Grand River. Fourth: Because said letters and each of them were incompetent, irrelevant and immaterial. Fifth: Because the copies of said letters and none of them were properly certified.

The court declined to sustain and overruled the said objections made by counsel for defendants and intervenors to

said letters and considered said letters in determining this case, for the reason stated in his opinion, to-wit: that the court took judicial knowledge of the same.

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(Plat of the Department of the Interior of Township
23, North, Range 3, East of the Indian Meridian,
of Survey of September 16, 1872.)

**BLUEPRINT
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(Plaintiff's Exhibit 5.)

(Plat of the Department of the Interior of Township
21, North, Range 8, East of the Indian Meridian,
of Survey of June 11, 1872.)

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(Plat of the Department of the Interior of Township
21, North, Range 9, East of the Indian Meridian,
of Survey of February 15, 1873.)

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(Plat of the Department of the Interior of Township
21, North, Range 8, East of the Indian Meridian,
of re-survey of January 15, 1909.)

**BLUEPRINT
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(Plat of the Department of the Interior of Township
21, North, Range 8, East of the Indian Meridian,
of re-survey of February 23, 1909.)

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791

(Plaintiff's Exhibit 9.)

(Plat made by H. J. Behning of the Island in controversy in the Arkansas River.)

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(Plat made by H. J. Behning, April 15, 1914, of the is-
land in controversy, in the Arkansas River.)

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(Plaintiff's Exhibit 67.)
(Profile of the Arkansas River from Cimarron to Little Rock, Arkansas.)

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(Hydrograph of the Arkansas River at Tulsa, Oklahoma, during the period of 1905, to 1915, inclusive.)

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(Topographical Map, Edition of May, 1915, surveyed
in 1911 and 1912 under the U. S. Geological
Survey.)

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(Profile made by W. C. Burk, which represents the elevation along the Range Line running North and South through the Island, etc.)

798 (Certificate of Counsel to the Statement of Evidence.)

We hereby certify that the above and foregoing is a correct statement of the material facts proved in the trial of the above cause, to-wit, the United States of America, plaintiff, vs. The Brewer-Elliott Oil & Gas Company, a corporation, et al., defendants, No. 75 Equity, in the United States District Court for the Western District of Oklahoma.

LEDBETTER, STUART & BELL

By H. L. Stuart;

Attorneys for Brewer-Elliott Oil & Gas Company.

LEDBETTER, STUART & BELL

By H. L. Stuart.

Attorneys for Pawnee-Osage Oil & Gas Co.

LEDBETTER, STUART & BELL

By H. L. Stuart,

Attorneys for Chickosage Oil & Gas Co.

LEDBETTER, STUART & BELL

By H. L. Stuart.

Attorneys for Number One Oil Co.

A. T. BOYS,

Attorney for Arkansas Riverbed Oil & Gas Co.

LEDBETTER, STUART & BELL

By H. L. Stuart.

Attorneys for C. J. Haskell.

S. P. FREELING,

Attorney-General of the State of Oklahoma.

Attorney for the State of Oklahoma, Intervenor

S. P. FREELING,

Attorney-General of the State of Oklahoma,

Attorney for the Commissioners of the Land

Office of the State of Oklahoma, Intervenors.

JOHN A. FAIN,

United States Attorney.

799 (Consent of Gypsy Oil Company to the Approval of the Statement of Evidence.)

The undersigned, Gypsy Oil Company, agrees that the statement of facts approved and signed by the Honorable John Fain, United States District Attorney for the Western District of Oklahoma, may be approved by the Court and the un-

dersigned Gypsy Oil Company consents and agrees to the statement of facts approved by the said United States District Attorney.

This the 21st day of January, 1919.

GYPSY OIL COMPANY,

By James B. Diggs,
Its Attorney.

800 (Approval of the Statement of the Evidence by the District Court.)

United States of America,
Western District of Oklahoma.

The foregoing condensed statement of the evidence in the above entitled cause is hereby approved as the record of the evidence for the purpose of the appeal therein.

Dated this May 5, 1919.

JOHN H. COTTERAL,
United States District Judge,
Western District of Oklahoma.

801 (Opinion of the District Court on Final Hearing.)

Francis J. Kearful, Assistant Attorney General, of
Washington, D. C.

John A. Fain, United States Attorney,

Isaac D. Taylor, of Oklahoma City, Oklahoma, for plaintiff.

S. P. Freeling, Attorney General of Oklahoma.

Ledbetter, Stuart & Bell,

Burwell, Crockett & Johnson,

Blake & Boys, of Oklahoma City, Oklahoma, for Defendants and Interveners.

This suit was brought by the United States as trustee for the Osage Tribe of Indians and for itself against several companies holding oil and gas leases from the State of Oklahoma of the bed of the Arkansas River, below high water marks, near Cleveland, Oklahoma, and located in sections 1, 12 and 13, range 7 east; sections 6, 7, 24 and 25, range 8 east; and sec-

tion 30, range 9 east; all in township 21 north, in this district. A decree is sought cancelling the leases, enjoining operations and obstructions under them, and quieting title to the premises.

As a basis for relief in behalf of the Indians it is alleged in the bill that the title to the river bed, limited in this case to the middle of the main channel, with the underlying oil and gas claimed adversely by the defendants, was granted and conveyed to the tribe, as a part of the Osage reservation, pursuant to law and treaty, regardless of the navigability of the river; and that as the river was then and still is non-navigable at the above locations, such tribal title also arose from the ownership of the adjacent lands. The further complaint that the derricks and structures maintained by the defendants constitute and should be abated as obstructions to navigation of the river if navigable, has not been pressed, and is without merit. The suit stands therefore as prosecuted solely in the interest of the tribe.

The State of Oklahoma and the Commissioners of the State Land Office intervened in the suit. They deny title in the tribe, and claim that the river is and always was navigable, that the title to the bed below high water marks was not subject to disposal by the United States, but was held in trust for the state, and that the state, on admission in 1907, by virtue of its sovereignty, became invested with the title and the right to make the leases, as was done, conformably to the State Constitution and laws. The lessees similarly plead their rights under the leases.

At the outset, upon stipulation of counsel, a receiver was appointed with authority to collect and preserve all royalties and bonuses arising from the production of oil and gas, under the terms of the leases and the regulations of the State Land Office, assisted by a supervisory committee, representing the conflicting interests. Later, The Gypsy Oil Company, a lessee of adjacent lands, was made a party defendant, because of controversy over a division line with the Scio-
to Oil Company, a defendant lessee, and the receivership was extended to the operation of its lease, but was later terminated upon adjustment between the parties, and operation was restored to the company. From an order construing that lease and directing the receiver as to the bonus payable from his funds by that lessee, an appeal has been allowed. Other orders have been passed in the course of the receivership, not essential to the controversy now before the court.

The case was tried and submitted at a full hearing; and counsel have presented their contentions in oral arguments and briefs, with a thoroughness and ability quite in keeping with the importance of the questions involved.

The main questions for decision are whether before the inception of any claim of title by the state, there was an effective grant of title to the tribe of the bed of the Arkansas River, even if navigable, and if not, then whether the river is navigable or not, whereby the title to the disputed portion was vested in the State or the tribe.

The claim of an antecedent grant is rested on the supposed exercise of a power vested in Congress thus to carry out a public purpose for which the lands were held. *Shively vs. Bowlby*, 152 U. S. 1, U. S. vs. *Winans*, 198 U. S. 371. *McGilvra vs. Ross*, 215 U. S. 70.

The Osage reservation was purchased from the Cherokee Nation and was a part of the lands the Cherokee acquired out of the domain of the Louisiana Purchase, the object of which was expressed in the treaty with France to be the formation of new states. (8 stat. 200, art. 3.). That policy was not, however, adhered to in providing for the settlement of the Cherokees west of the Mississippi River. As the lands described in their patent of December 31, 1838, lie on both sides of the Arkansas River here involved, the first inquiry is naturally whether they had a title to the bed of the river, if navigable.

804 The treaties and acts affecting their title are reviewed in the case of *Heckman vs. U. S.* 224 U. S. 413. The stipulations made in their favor that they were to be secured a permanent home, not embarrassed by state lines or jurisdiction, and a free and unmolested outlet on the west, and were authorized with limitations to make local laws concerning persons and property did not exclude but implied the need of Federal control over navigable streams, if any, in their country. It would remain not only consistent with the rights of the Indians, but important to their advancement that any avenue of transportation be kept open for their benefit. A similar policy toward the Indians is found in the Congressional grants for the construction of railroads through Indian Territory. And the Act of March 3, 1911 still applied in providing that "all navigable rivers and waters in the former territories of Orleans and Louisiana shall be and forever remain public highways." Conceding full force to the laws and treaties applicable, it is clear that the Cherokees had no title

to any navigable stream in their country. As a result, they could convey none in any event to the bed of the Arkansas River, at the Osage boundary, if there navigable.

The next question is with reference to the title acquired by the Osage tribe. By treaty and law, provision was made for the sale of their lands in Kansas, payments to them, and their removal to Indian Territory. (Treaty, Sept. 29, 1865, 14 stat. 687. Act July 15, 1870, 16 stat. 362). The Cherokees stipulated in the treaty of July 19, 1866 (14 stat. 799), for the settlement of friendly Indians in their country west of the 96th Meridian, with terms of payment left to future agreement etc. As the early settlements occurred east of that Meridian, by the Act of June 5, 1872 (17 stat. 228), selections west of it were confirmed as their reservations, within which they were to permit the settlement of the Kansas tribe, which was to make payment from the proceeds of lands in Kansas, and

805 the lower boundary of the reservation was defined as the north line of the Creek Country and the main channel of the Arkansas River. The Act of March 3, 1873 (17 stat. 538), provided for payment to the Cherokees out of the funds of the Osages for the lands purchased by them. By the Act of March 3, 1883 (22 stat. 624), a further payment was appropriated out of funds due under appraisement of Cherokee

River, kee lands west of the Arkansas/, and the Cherokee Nation was to execute conveyances satisfactory to the Secretary of the Interior to the United States in trust for the Pawnees, Poncas, Nez Perces, Otoes and Missourias, and Osages "now occupying said tract as they respectively occupy the same before payment of said sum of money."

A formal deed was executed on June 14, 1883, by the Cherokee Nation to the United States in trust for the Osage and Kansas Indians. Certain whole and fractional townships were described, and the latter as being on the left bank of the Arkansas River, according to a plat annexed and made a part of the conveyance. It was also recited that a part of said lands had been set apart for the Kansas Indians, consisting of townships whole and fractional, then described and indicated on the plat.

On the plat is a note, reciting that all the islands opposite the lands described is the deed, except Beaver and Turkey, in township 23 north, range 3 east, conveyed of even date for the the Otoe and Missouri Indians, are "a part and parcel of/

lands set apart for the Osage and Kansas Indians, and are covered by and embraced in this plat and the foregoing deed of conveyance." In addition, an island, apparently illustrative, is shown as the west boundary of the Osage reservation.

The deed did not limit the area of the Osage lands, as confirmed by the Act of 1872. As it was but a fulfilment of treaty and law, the authority of the Secretary of the Interior was to require conformity with them. The designation of the 806 river boundary as the main channel in the Act and the left bank in the deed are therefore held equivalent. A sufficient reason for holding that there was no limitation by the deed is that the title was vested in the tribe by the Act of 1872, without a deed. *Jones vs. Mehan*, 175 U. S. 1. *Francis vs. Francis*, 203 U. S. 233. *Chase vs. U. S.* 222 Fed. 593.

The plat and note were effectively incorporated in the deed by reference, *Cragin vs. Powell*, 128 U. S. 691. *Jeffries vs. East Omaha Land Co.*, 134 U. S. 178. *Beach Front Hotel Co. vs. Sooy*, 197 Fed. 881. The authenticity of the note, which has been questioned, is presumed, as a part of the official records of the Indian Department, and it is confirmed by the letter of March 20, 1883, from the Commissioner to the Secretary of the Interior, in which he furnished descriptions for the deed, and stated that all the islands above the north boundary of the Creek Country, except Beaver and Turkey, belonged to the Osage and Kansas tribes. But the inclusion of the islands in the deed can be relevant in this case only if it tends to throw light on the title to the bed of the river. Assuming that the deed in that respect has a permissible bearing, the inference would be that the bed was not meant to be conveyed, although a resultant title would attach to it, as far as the middle of the main channel of the river, if it was not navigable.

No purpose is disclosed in the transactions relative to the Osage lands to invest them with such an extraordinary right as title to a navigable stream. The policy of the Government has been to advance them speedily for the duties of state citizenship. As manifesting this, their reservation was by the Organic Act of May 2, 1890 (26 stat. 81) included in the Territory of Oklahoma, the initial step toward statehood in Indian Territory; and in the Enabling Act (34 stat. 539, sec. 21), it was provided that their reservations should become an organized county of the state.

807 The conclusion best sustained is that there was no grant or conveyance to the Osage of title to the bed of the Arkansas River, if in fact navigable at the boundary of their reservation.

A question arises whether the title was vested in the tribe by a portion of the bed of the river by section 4173 of the laws of Oklahoma Territory, passed in 1890, appearing in section 6639, of the Revised laws of 1910, and apparently continuing in force by the Schedule of the State Constitution, providing in substance that except where the grant indicates a different intent, riparian proprietors take to the edge of navigable streams and lakes at low water mark, and the bed of the non-navigable belong to the opposite owners in common. The adoption of that section into the Laws of 1910, was withdrawn as to owners of land on navigable waters, saving vested rights, by an Act approved March 22, 1913 (Sess. Laws, 117).

It was held by Judge Campbell, in the Mackey case, (30 Fed. 137) that as the legislative power of the territory was limited by the Organic Act (Sec. 6) to rightful subjects of legislation not inconsistent with the Federal Constitution and laws, the provision as to lands on navigable streams was in excess of its power and invalid, and was not therefore adopted by the state. Further discussion is unnecessary, as the ruling is deemed to be sound, and to be concluded by the approval of the State Supreme Court, in *State vs. Nolegs*, 10 Ok. 479; 139 Pac., 943.

No reason appears, however, for holding that the other provision of the section relating to lands on non-navigable streams was not competent and legislation or was not legally adopted by the state; and it is accordingly held to be valid from its enactment. Congress had long before declared the same effect as to streams in the public lands. Sec. 24, Rev. Stat. And by the common law, doubtless applicable in the absence of a statute, a riparian owner takes title to the middle of the adjacent stream. *Railroad Co. vs. Schurme*, 7 Wall. 272. *Hardin vs. Jordan*, 140 U. S. 371. *Scott vs. L*, 100 U. S. 229.

808 The remaining and all important question is with respect to the character of the river at the locations where the leases, presented more broadly by the contention for the tribe that it is not navigable in this state above the mouth

of Grand River, and for the intervener and lessees that it is navigable throughout the state.

If the river is not navigable at those locations, then the tribe, as riparian proprietor, owns the bed to the middle of the main channel, and by the terms of the Osage allotment act of June 28, 1906 (34 stat. 539.) the minerals therein belong solely to the tribe, and are subject to lease only for its benefit. But if the river is there navigable, then by the general rule invoked by the interveners and defendants, as broadened in this country and in force in Oklahoma, the title to the bed was held in trust for the state, and inured to it when admitted, on an equality with the others, subject to the paramount authority of Congress in the control of navigation to the end of regulating interstate and foreign commerce. *Martin vs. Waddell*, 16 Pet. 367. *Pollard vs. Hagan*, 3 How. 212. *The Genessee Chief*, 12 How. 443. *Shively vs. Bowlby*, 152 U. S. 1. *McGillra vs. Ross*, 215 U. S. 70 *Scott vs. Lattig*, 227 U. S. 229. *United States vs. Cress*, 243 U. S. 316. And the power of the state would then arise to appropriate and dispose of the oil and gas found in such lands, consistently with the above limitation. *Weber vs. State Harbor Comrs.* 85 U. S. 57. *Hardin vs. Jordan*, 140 U. S. 371. *Wood vs. Fowler*, 26 Kansas 682. *State vs. Akers*, 92 Kans. 169, 140 Pac. 637. *State vs. Nolegs*, 40 Ok. 479. 139 Pac. 943.

The issue of navigability is one of fact. The purely "legal test" cannot be accepted. A river is not navigable, unless so in fact. It will be deemed navigable, when used or susceptible of use, in its ordinary condition, as a highway of trade and travel in the customary modes on water. *The Daniel Ball*, 10 Wall, 557. *The Montello*, 20 Wall. 441 *United States vs. Cress*, 243 U. S. 316. The exceptional use of a stream
809 for purposes of transportation in times of temporary high water, or "the mere fact that logs, poles and rafts are floated down the stream occasionally in high water does not make it a navigable river." *U. S. vs. Rio Grande Irrigation Co.*, 174 U. S. 690. "To meet the test..... a water course should be susceptible of use for the purposes of commerce or possess a capacity for valuable floatage in the transportation to market of the products of the country through which it runs. It should be of practical usefulness to the public as a public highway in its natural state and without the aid of artificial means. A theoretical or potential navigability, or one that is temporary, precarious, and unprofitable, is not sufficient". *Harrison vs. Fite*, 148 Fed. 781.

This river has been the subject of decision in several cases. *Hurst vs. Dana*, 86 Kans. 947, 122 Pac. 1041. *U. S. vs. Mackey*, 214 Fed. 137. *Id.* 216 Fed. 126. *State vs. Nolegs*, 40 Ok. 479, 139 Pac. 943.

In the *Hurst-Dana* case, where the title to an island near Hutchinson, Kansas, was involved, and a trial was had to a jury as to present navigability of the river, the judgment was reversed, and the Supreme Court held the river to be there navigable, on the ground of former navigability, of which judicial notice was taken.

In *Mackey vs. U. S.* 214 Fed. 137, the navigability of the river near Tulsa, Oklahoma, was treated as practically conceded at the oral argument, and the decision in the *Hurst-Dana* case was approved. The decree was reversed, with leave to answer, because rendered upon motions to dismiss, and without evidence, the Creek Nation being held to have sufficiently alleged ownership of the disputed premises, the agreement as to the facts not being of record, and a clear case for judicial notice not being warranted. 216 Fed 126.

In *State vs. Nolegs*, supra, the State had sued to quiet title to the bed of the river and an island, at the location here involved. The adverse parties were adjacent land owners and grantees, and Nolegs, an Osage Indian allottee of the island. A main question was whether the court would take judicial notice of the navigability of the river, in the sense of vesting title to the bed in the State. The *Hurst-Dana* case and the *Mackey* case in 214 Fed. 137 were cited and approved. In addition, reference was made to the Eleventh Census Report of 1890; to a letter dated in March, 1908, from the Commissioner of Indian Affairs, approved by the head of the Interior Department, holding the river to be navigable through the Cherokee Nation, and that Nation not entitled to royalty for said and gravel in the river bed after statehood, and conceding the title of the State to the beds of navigable streams in the Five Tribes; to the Act of February 17, 1897, authorizing a bridge near Cleveland, Oklahoma; to the Act of January 29, 1897, granting a franchise for a railroad through Indian and Oklahoma Territories; and to the Act of February 24, 1902, authorizing a bridge at Fort Gibson. The river was held navigable in its entire course through the state, the title to the bed below high water marks to be in the state, and the title to the island above those marks not in the state and to concern only the United States (not a party) and the allottee, and it was not determined.

Harmony in judicial decisions is recognized to be important, especially in the same state. But upon a question of general law, this court will exercise an independent judgment, although leaning to agreement with the state court, if the question presented is balanced in doubt. *Sim vs. Edenborn*, 242 U. S. 131. In the case of *United States vs. Rio Grande Irrigation Co.*, 174 U. S. 690, involving the Rio Grande River (notably similar to the Arkansas River), it was held that while the court should take judicial notice that an important river is navigable, the point where navigability ceases, unless it is or ought to be within general knowledge, requires proof, and upon the affidavits and other evidence, the Rio Grande River was found not navigable in New Mexico. In the present case, giving to all matters within general knowledge full weight, no sufficient reason is found to sustain a holding that the Arkansas River above the mouth of Grand River in this state is or ever has been navigable, as a matter of judicial notice; and the soundness of that view has been well demonstrated by proof.

In the *Mackey* case, 216 Fed 126, decided two years after the *Hurst-Dana* case, and more than four months after the *Nolegs* case, the court declined to hold the Arkansas River navigable near Tulsa, where the Creek Nation had alleged title to the bed, but sent the case back for answer, whereby the issue of navigability might be tried. The same view is shown in *Producers Oil Co. vs. U. S.* 245 Fed. 651, where the character of the Cimarron River was held subject to proof.

This court is therefore bound to hold that the issue as to the navigability of the Arkansas River is dependent upon proof in fact by evidence and other proper sources of information.

The case of *Wear vs. Kansas*, U. S. (Nov. 26, 1917), is not authority to the contrary in holding that 'if a state court takes upon itself to know without evidence whether the principal river of the states is navigable at the capital of the state, we certainly cannot pronounce it error', that "in this aspect it is a question of state law", that "the fact is of a kind that should be established once for all, not perpetually retried", and that the state court had in favor of its decision legislation, averments in pleading, former decisions of that court and the assent of the Supreme Court. The Arkansas River is not so located, its navigability is not so aided by legislation pleading decisions; and the *Nolegs* case was decided during the pendency of the present litigation.

The effect of meandering the Arkansas River, cited as supporting navigability, upon authorities, is over-estimated. In navigable streams, it defines the sinuosities of the banks and the fractional areas of lands sold. *Railroad vs. Schurmeir*, 7 Wall. 272. *Hardin vs. Jordan*, 140 U. S. 371. The Government surveyors may not thereby determine the title
 812 to adjacent lands. *Iowa vs. Rood*, 187 U. S. 87. Such lines are not deemed of certain significance. *Kean vs. Calumet Co.*, 190 U. S. 452. The Land Department employs them to denote streams of more than three chains in width but only under special instruction in the case of non navigable streams, and at times, they have been run when not thus authorized, *Hattie Fuhrer*, 12 L. D. 556. *James Smith*, 18 L. D. 135. Doubtless all navigable streams are meandered; and the fact in this case should be taken merely as some evidence of navigability. *Harrison vs. Fite*, 148 Fed. 781.

Acts of Congress making appropriations for the improvement of the Arkansas River and bridge grants have been noticed as specially importing navigability. The former may be summarized as beginning in 1879, being available as far as Wichita up to 1894, in Arkansas and Indian Territory until 1899, then limited to Arkansas until 1912, and next generally to Arkansas and Oklahoma until 1916. It was shown that no expenditures were required above Grand River, and all except the first were made below that point. In general, such acts should be assigned weight, in view of the power of legislative inquiry and judgment. But their force is not to declare a river navigable in its natural state, *U. S. vs. Cress*, 243, U. S. 316; and none of these acts purport to do so. A project for river improvement may be to create navigability, or however prudently formed, may be necessarily experimental, and result in practical abandonment at a given section. When these acts are considered together and in the light of the engineers' reports and the fact that improvement of consequence was withheld above Grand River, the inference is justified that the river was ultimately not deemed navigable at the upper locations in the state. The bridge grants, while implying a state of navigability, may be due to prior appropriation acts, the holding of the War Department, or precaution in a doubtful case. Instances are cited of grants for bridges upon the South Canadian River, said to be non-navigable, at Noble, Lexington, and in Blaine County, in
 813 this state. (28 Stat. 103, 225, 644.) While the acts are proper for consideration, they are in any event incon-

clusive, and leave the fact of actual navigability quite open to proof.

The Interior Department has not held, as supposed, to the navigability of this river at the Osage boundry. On the contrary, with the exception of the approved letter of March 27, 1908, from the Indian Office, its position was defined in a letter of the Secretary, dated April 20, 1915, to the Attorney General, to be as stated by the court in *Kansas vs. Colorado*, 206 U. S. 46, "that the Arkansas River is not now and never was practically navigable beyond Fort Gibson in the Indian Territory." Explanation was given that the letter of the Indian Office referred to the river in the Cherokee Nation only, and was erroneous, "being based on a misconception as to the facts and misinterpretation of the views of the Supreme Court as expressed in its decision in the case of *Shively vs. Bowlby* (152 U. S. 1)", and "not in accord with the views of the Department as to the status of the bed of the Arkansas River, or as to the title thereto." It was added that when the Creek Nation acquired its lands on August 11, 1852, the river was considered not navigable therein, from a report from Col. Long, of the Corps of Topographical Engineers, partly embodied in the report of Col. Abert, transmitted on January 27, 1854, by the Secretary of War to the Senate, from which it appeared that the river is navigable only to the junction of the Verdigris and Neosho rivers, and that such navigability is potential rather than actual.

The War Department formerly took a different position. In a letter of October 11, 1911, quoted in another of May 16, 1914, Acting Secretary, Oliver, informed the Attorney General that the navigability of the river in Osage County, Oklahoma, appeared from a report of the engineer authorities "within the purview of laws enacted by Congress for the preservation and protection of such waters and of 814 decisions by the Supreme Court," as the Department had uniformly held. In a memorandum of September 16, 1914, justification was given for the attitude of the Department. Extended correspondence resulted from efforts of the Attorney General to obtain evidence from the Department in the pending litigation, which was tendered as to records etc., but declined as to witnesses, the President being appealed to meantime, whereby the views of the Department were elicited more fully and its duty pointed out, and later, after a reconsideration, opinions supporting its position was furnished by the Judge Advocate General (Crow-

der) and the Chief of Engineers (Kingman). Finally on request for the detail of witnesses, P. R. VanFrank, Jr., of the Little Rock Office, was directed to make examinations and give his testimony.

But the Department is now committed against that view. In the letters of November 24, 1916, responding to a request of the Attorney General for a revocation of the letter of October 11, 1911, the present Secretary stated that in his judgment the records of the Department show the head of navigation on the Arkansas River to be at the mouth of Grand River, and that the Arkansas River is not navigable above that point, although formal revocation was withheld as a course less orderly and less advisable from an administrative view point. The objections urged to these letters, written after the trial of this case, and submitted on service of copies, are held not tenable, as judicial notice should be taken of them, *Heath vs. Wallace*, 138 U. S. 572.

The testimony of General Crowder and General Kingman, identified the opinions furnished by them to the Secretary, and the latter gave his views in detail. The testimony of Major Kelly was to the effect that three bridge permits were granted from 1901 to 1912, at Fort Gibson, Muskogee and Tulsa, and that another was refused at Tulsa; and his views were given. These witnesses did not testify from personal knowledge of the river in Oklahoma. Their testimony
815 tends to sustain and reflects the former holding of the War Department.

Valuable evidence is found in the reports of engineers in the War Department, chiefly printed in various Executive Documents. They cannot be given fully, or in respect of measurements and tests, but sufficient reference to them may be made to show their weight in the case.

From an account of Capt. Bell, as early as 1820, Fort Gibson was noticed as situated as the head of navigation. It was said that the current of the river was much less rapid than that of the Platte, but the character of both, "in a considerable degree, corresponds in their widely spreading waters of but little depth, running over a bed of yielding sand." (Prof. Papers, War Dept. No. 13.) And in Long's expedition, the same year (Thwaites, 1905) the river was said to be navigable to the mouth of the Neosho, or Grand, a distance of about 600 miles. According to the report of Col. J. J. Abert, in 1854, the river was navigable only to the junction with the Neosho and Verdigris, and the report of

Col. S. T. Abert, in 1870, it could not be navigated above its junction with the Verdigris.

In February, 1879, Major Suter reported from a hurried reconnaissance of an assistant that the river from Wichita to Fort Smith had a navigable depth the first 70 miles of 6 inches and the remainder of 12 inches, with a channel much obstructed by snags. He was of opinion that by removing snags and constructing slight dams at Shoals—the extent of advisable work before general improvement—navigation would equal that between Little Rock and Fort Smith. The next year, the chief of engineers reported little progress with a snag boat due to low water and late season, proposed a renewal of operations as beneficial to flat boat navigation and recommended appropriations. In 1881, engineer Curtis reported his efforts to examine and clear the river from Wichita to Fort Smith, under difficulties indicative of non-navigable conditions.

The only other and the chief improvement entered upon above Grand River was in that year by Capt. Evins, with the snag boat "Wichita", which was well equipped and drew 15 inches. In his experience covering seven months, under a plan of work up to Arkansas City and return, he was able only to reach Pawnee Agency Landing, about 75 miles below Arkansas City, and was detained from fall to spring in returning by low water, sand and rock. In his letter to Capt. Handbury, in June, 1882, it was said from observations that a good channel depth of three feet could be made to Arkansas City. In the annual report for that year, concentration of the channel was indispensable above Grand River, a survey and study of conditions advisable, the improvement feasible, and the benefit to a productive section cited. The work, however, was never resumed on the upper portion of the river.

The report for 1883 refers to work between Fort Smith and Fort Gibson, and that for 1884 to the operations below Fort Gibson, and to a survey in progress from Wichita to Tulsa. The report for 1885 states that the original plan of improvement was the removal of snags and trees and the contraction of the channel at shoals, that the expenditure of \$59,000 resulted in practical value to navigation, and that the river was in excellent navigable condition up to Fort Gibson, but above that point a large outlay would be requisite to make it navigable, as shown by a survey. It was added that a steel steamer with a fleet of five steel barges none drawing over 12 inches had been put on the river from Arkansas City

to Fort Gibson, on which data were being secured, thought portending a revolution in navigating upper reaches of shallow rivers, that an enormous commerce waited this southern outlet, that the notes were being worked up and "a full report with plans and estimates will be submitted in time for the action of the next Congress."

817 In November, 1884, Engineer Burrows, reporting to Capt. Taber a survey of the river from Wichita to Grand River, stated that no portion was or had been considered navigable, and that the mouth of the Grand River was considered the head of navigation, commerce for 40 miles below being practically nil, adding that a small boat of light draft had made the trip from Little Rock to Arkansas City on the crest of a short rise, carrying no freight of consequence, and of no practical benefit in demonstrating navigability. His opinion was that the river could be made navigable by dams, dikes and confined channels, ranging from 200 to 500 feet, in different sections. In transmitting that report, in 1886, Capt. Taber reported that a two-foot channel could be provided and "the river should be, for all purposes of law, rated as navigable to Wichita." He proposed plans for permanent improvements by placing wing dams on shoals, employing dikes to protect banks, cause deposits and contract the water, and by temporary snag boat work. He adverted to the arrival of a steel steamer and barges as making a change in conditions of the problem of improvements, quoting an article from the *Globe Democrat* which described a small tow boat built for shallow waters and its departure for Arkansas City.

In March, 1888, a permanent board of engineers on improvement of the river from Wichita to the mouth of the Canadian River, reported that the commerce over that section is and always has been practically nothing, estimated the cost by contraction works of a navigable depth of two feet at low water as exceeding their value, expressed grave doubts as to maintaining it, and designated movable dams or a canal as a proper means of obtaining steady navigation, if justifying the expense.

In the annual report for 1890, Capt. Taber again refers to Wichita as the head of navigation on the river, and it is cited along with other cities in the valley demanding a river outlet to cheapen over a million tons of freight etc.

818 This report probably was the foundation for a similar account in the Eleventh Census Report, and it is practically repeated in the report of the same officer for 1891.

After the incumbency of Capt. Taber, (1884 to 1893), the succeeding engineers point with certainty to the non-navigability of the upper river in the state. In 1894, no navigation was reported above Webbers Falls. From the report of Gen. Sibert for 1895, it appears that there was only one trip—by a small boat—to Fort Gibson during the year. In 1898, the estimate for completing the project of improvement from Wichita to the mouth of the river was called “indefinite”. The next year, the statistics showed no navigation above Little Rock.

A board of three engineers appointed by the President, pursuant to an Act of Congress to thoroughly examine the river, with a view to permanent improvement, reported in 1899 that the mouth of the Grand River had always been considered the head of navigation, that attempts at navigation above that point had been of rare occurrence and soon [abandoned], and that the river between Wichita and the Grand is crossed by nineteen fixed bridges and two fixed dams.

In 1902, with the exception of a trip by the “Carrie Clyde” from the mouth to Grand River, no navigation appeared above Shoal Creek, 88 miles below Fort Smith. In 1903, Fort Gibson was named as the head of navigation and the statistics showed no commerce above Webbers Falls, and in 1904, Fort Gibson was noted as the head of steamboat navigation. And except in 1906, this was repeated in the reports for the next ten years.

In 1909, Maj. Walker reported upon the section between Tulsa and Grand River that the steep slope, low water and shifting sands and gravel precluded improvement of worth for navigation purposes by regulation works, and submitted estimates only for locks and dams, but deemed it unworthy of improvement. He stated that the mouth of Grand
819 River had always been considered as the head of navigation, and that his office (Little Rock) had no information of any commercial navigation above that point.

The reports were directly supplemented by the testimony of General Sibert, Major Walker, P. R. Van Frank, Jr., and Capt. Evins.

General Sibert was for thirty years an officer in the engineer corps, and from 1894 to 1898, had supervision at the Little Rock Office over the Arkansas River. He observed and acquired data as to its character, and was assisted by Van Frank, a competent engineer. No record was recalled of

commerce above Grand River, which was considered by the steamboat operators and accepted by practically all of the engineers as the head of navigation, although there was an account of one or two boats going above it. In addition to explaining by measurements and tests the difficulty and cost of regulating or "canalizing" the stream, he was of opinion that from the small amount of water, and the character of the channel, bed and banks, the result in practical utility would not warrant improvement from Tulsa to Grand River. It was thought loose logs or rafts would ordinarily be landed on sand bars, and that the shifting channel and violent changes within rendered navigation impossible. In an elaborate report, with citation to authorities and data, to the chief of engineers in April, 1898, he said:

"No constant diminution of the water supply in the navigable part of the Arkansas River, is shown by the records so far as I can see. Tradition and history seems to establish the fact that the navigable depth of the Arkansas River was as small at times prior to 1860 as it has been since. There is nothing in the records of the last 20 years to show that these periods of extreme low water are of more frequent occurrence since 1888 than in the ten years prior to 1888."

And "summing up the records and testimony," he could not state definitely that irrigation had decreased the
820 navigable capacity of the river, although the length of the dry bed in the upper portion had increased and the periods were more frequent.

Major Walker, of the corps of engineers, long in service, had supervision at the Little Rock office of the Arkansas and other rivers, from 1908 to 1910. He gave the project as being for the improvement of the Arkansas River from Wichita to the mouth, with discretion in the War Department as to expenditure of the appropriations. Under the Act of March 3, 1909, he was directed to make an examination between Tulsa and Forth Smith with a view to recommendation for improvement. He examined the office records, observed the river at Fort Gibson, and examined it at Muskogee and Tulsa, aided by Van Frank, commended as fully capable for the work. His opinion was that the river could be made navigable from Tulsa down, and that from the appropriation bills contemplating the improvement the river was presumed to be navigable from Wichita to the mouth.

The mouth of Grand River was regarded by him as the head of actual not potential navigation. No expenditures

were considered above that point. He had no information as to commercial navigation above it, except from the report of Capt. Taber, containing the account of steam boat and barges. Various reports were referred to, and notwithstanding his own for 1909, approved by the Board of Engineers and the chief, he deemed the river was navigable above the Grand River, based on the feasibility of floating logs, (of which or its commercial value, however, he had no personal knowledge) which he considered practical at the time from data in the Little Rock office as to the flow of water. He knew of no one more familiar with the subject than Van Frank. There was further reference to the estimates in his report of dams ranging in cost from \$3,781,500, to \$10,044,000, and annual maintenance ranging from \$340,630, to \$541,880, contemplating transportation by boats and barges. The witness was unable to answer whether the river could be made navigable to Wichita. A cause
821 given for his recommendation against improvement was the effect of railroad facilities in decreasing river transportation.

P. R. Van Frank, Jr., was principal assistant in the Little Rock District since 1891, engaging in field work on the Arkansas, St. Francis and White Rivers until the fall of 1913, and afterward in the Little Rock Office, which was established in 1881. His duties were the preparation of plans, supervision and examinations, approval of reports and other work. He assisted in the report of Gen. Sibert in 1908 on the question of diminution of the Arkansas River by Irrigation. In his opinion, there was no subsequent change. He took part in the examination of the river at points between Wichita and the mouth, and the compilation of the data for the report of engineers in 1899, and assisted by engineer Parkin prepared the draft of the report by Major Walker in 1909, on the river from Tulsa to Fort Smith. He defined the elements for determining the capacity of a stream as volume of flow, nature of the bed, general slope, and general nature of obstructions in the channel; and prior use of the stream was regarded as a self-evident index. From a special examination of the river, he gave the water flow of the Arkansas as practically the same at Tulsa and above the Verdigris, and showing an abrupt increase below the Grand River. He explained that it was not possible to make a channel of worth above that point by contraction works due to lack of water and to steep slope, but practical to "canalize" it, movable dams being preferable. His opinion was that above Muskogee a dependable two foot channel could not be obtained, except in April or probably

May or June. He also referred to boats operating in the lower river, one of them going 20 or 21 miles above Muskogee and not returning.

Capt. Evins began "steamboating" in 1852 and came to the Arkansas River in 1860. He built the "Wichita",
 822 which was lighter than the other boats known to him, and reported to Capt. Handbury, at Little Rock. In going up stream, it was necessary to take advantage of rises, and resort to spars and a capstan, at sand bars. He was at Pawnee Agency Landing almost four months, on account of low water, returning with delays, on high water, and thereafter the boat was not used in that section, because not feasible. The water was about the same as in other late seasons. He made no further attempt to go above Fort Gibson, and had no knowledge of business on the river, but heard of a couple of boats going up. The boats would stop at Grand River, which they ascended a couple of miles to Fort Gibson. His estimate was that the Grand River furnishes four times the low water flow in the Arkansas, as it is a clear stream, is narrower and has a gravel and clay bed. Since familiarity with the Arkansas River in 1860, there has been no great change in the water volume, but it has constantly increased in width from erosion of banks, affording almost one half less navigable water. He named the boats operating at lower portions. The "Kansas Miller", afterward renamed the "Cleveland", made one trip above, was taken over by the Government and used by him. The "Mary D" was run from Fort Smith to Fort Gibson. The "City of Muskogee" also went above Fort Smith. His report to the chief that a navigable depth of three feet could be had to Arkansas City was attributed to his clerk and was unauthorized and incorrect.

Charles H. Miller, another engineer of practical experience in river work, also gave his testimony. His acquaintance with the Arkansas River began in 1905. He examined it at Wichita and Oxford, Kansas, in 1907 and from Cleveland to Tulsa in 1915, and was familiar with the reports and documents in evidence, from which he gave measurements and tests. He thought it not practicable to contract the channel above Grand River, so as to furnish a channel depth, the feasibility of "canalization" was uncertain, that fixed
 823 dams were useless but movable dams possible, with dredging work, for maintenance of the channel in all seasons. He prepared a hydrograph of the river at Tulsa and Webbers Falls from gauge readings of the Weather Bureau, between 1905 and 1915, and at the latter place between 1904

and 1911. In his opinion, the river did not have a navigable capacity for trade and traffic in the customary modes above the mouth of Grand River, and could not be made useful for transportation of freight, and a canal could not be built in the river. Skiffs could be used at any time, but not naphtha launches. He disagreed with the engineering estimates of 1909 that the river could be made navigable between Fort Smith and Tulsa by locks and dams, at a cost of over \$10,000,000. He and Van Frank took part in an experiment with two boats in the river between Cleveland and Tulsa, meeting difficulty in finding the deep water, frequently landing on sand bars from which they had to pull the boats. At that time, when there were ten or fifteen times the ordinary low water flow a flat boat could have been taken over it carrying a couple of tons, if small enough to get through the channels.

There was further testimony of witnesses, who had resided at or near Little Rock, Muskogee, Tulsa, Cleveland, Arkansas City, Wichita and other points.

Edwin Houston, of Little Rock, was engaged in steam boating on the river since 1855, between the mouth and Fort Gibson, and when first there, Fort Gibson was considered the head of navigation. His acquaintance with the river was not over three miles above Fort Gibson. No change had occurred except it varied by periods. Navigation became unprofitable and fell off 90 per cent from railroad competition. The "June rise" continues, and was attributed from report, to spring rains. The river between Little Rock and Pine Bluff, since the war, was navigable about half of the time, but longer in the early days with the different boats. Navigation
824 is limited by the water depth on the shifting bars.

Overflows occurred at Little Rock in 1866 and 1844. There was no change in average width or depth of the river up to Fort Gibson. The longest period of low water was in 1861. In 1858, it was dry and traveled by cattle, at the mouth of Grand River.

David B. Chapman lived at Argenta, opposite Little Rock, and was a boatman on the river about 40 years. Fort Gibson was considered the head of navigation, when he first plied the river. The stern wheel boats of the early days went into disuse, the later types being of less draft. In his opinion, navigation was impaired by the widening of the stream, but there was probably not any other change. The river could be made navigable at Little Rock, Fort Smith and Fort Gibson with the later boats, but the expense of confining the channel

was not justified. His estimate was that fully two thirds of the flow in the Arkansas River came from the lower streams, and the taking of water above the Wichita would reduce the stream. He regarded the upper reaches of the river in the vicinity of Wichita and above Fort Gibson as treacherous and incapable of practical navigation. He planned the "Cleveland," at the expense of four citizens, who accompanied him from Arkansas City.

Residents of Muskogee show that the boats at the east section of the state, while largely used in hauling products and merchandise, plied below the mouth of Grand River. One of them, the "Cleveland," probably called previously the "Kansas Millers," was a freight boat running between Fort Smith and Webbers Falls. It was later sold to the Government and put upon the work a few miles above Fort Smith. In one instance, a boat named the "Carrie Clyde," built for ferrying but used for freight was taken to Choska twenty miles above Grand River; and when loaded with lumber sank and was lost on a sand bar. Two of the boats appear to have been
 825 purchased by citizens or the commercial club of Muskogee to demonstrate the navigability of the river and influence freight rates, which were reduced. One of them, the "City of Muskogee" was used for excursion purposes, but after a month was sold at a loss and converted by a pilot into a hydraulic dredge, and later was bought by a packing company at Newport, Arkansas.

A pilot on the river from 1855 to 1892 gave his experience in floating logs a few miles above Muskogee on high water, with a steamboat in connection, and was delayed at one time four days. He made a special effort along with good river men to float walnut logs from Choska, and waded to find a channel, but failed for lack of water and the logs were hauled to Catoosa. He knew of other attempts at Tulsa, when the logs floated out of the river. He also had logs at the mouth of the Cimarron River from the Osage country in 1891, and started them on a good rise, in bunches of six to ten, with a man assigned to each, and some of them went a half mile, and one three miles, and they were hauled out the next summer. He described the river as narrowest between Webber Falls and Grand River, so that a boat of 90 to 100 tons, drawing twenty four inches, could travel that portion almost any time, subject to trouble in keeping the water. On one occasion, he took a boat eighteen or twenty miles above Grand River and returned on falling water by pulling the boat over the bars for four miles, at different places.

Ferryment at Tulsa employed boats moved by poles, or by wire and pulleys in high water, transporting passengers, vehicles and commodities across the river. Steam and gasoline power could be used only in high water, and were given up as unsuccessful. Sufficient water was uncertain, and to avoid sand, routes and landings had to be shifted, delays occurred and at times unloading was required in the water. Ferrying was usually suspended about half the year, when the river was forded. Another ferry was located about one fourth mile below, and two others in and near the mouth of the Cimarron River. The craft at Tulsa consists of skiffs, gasoline launches, and a few house-boats used as dwellings. There was no commerce up and down the river. Account was given of boats going down on four or five feet of water and being hung up on return. Most of the rises are in the spring, usually in May or June, but unreliable, and may be sudden or gradual, dependent on rain, lasting a week or two if from Colorado east, and a day or two if local.

The river was described as composed of sand and a shifting channel. It was said that a boat could ply there on high water if the bars could be found and avoided. An experience of two ferrymen was given in taking two and a half tons of hay in a ferry-boat, 12 by 40, drawing seven or eight inches, moved by poles, from Blackburn and bound for Tulsa. They were stranded at Cleveland twelve miles out, and meantime they had frequently to push and pull the boats from the sand bars. It was said that at ordinary high water the hay could have been carried. On another occasion, a house-boat 12 by 24, with contents, drawing 6 to 8 inches made the trip on three or four feet of water. An attempt to haul lumber up and down the river failed after three or four trips. An estimate was given that in 1915, when there was more water in the river than in seven or eight years, a boat of twelve inches could depend on thirty days of travel up the stream, but on three days in the two preceding years. In another experience, a ferryman sought to haul two tons of lumber in a flat boat, 14 by 25, with a sail, from Sand Springs to Tulsa, seven or eight miles, and although the day before he had staked the channel with thirty or more willows, he ran into a sand bar, and had to unload, pull off the boat and reload in the water, and was a day getting back, all in the same state of water. One of the ferrymen cited an instance where a party floated logs, 18 or 20 feet long, from the mouth of the Cimarron, and put a man behind with a skiff to push them off the bars and islands.

827 A miller and stockman at Cleveland, near the disputed portions of the river, a resident there since 1893, built a boat, 9 by 43, six horse power, drawing 12 or 14 inches, and used it in 1897 and 1898, for hauling hogs, gun stocks and wheat to Tulsa, a distance of 50 to 65 miles, and returning with merchandise, to some extent. The boat had capacity for 60 or 70 hogs. He made three to six trips in each of the seasons, between May and August, taking advantage of the rises of five to eight feet, which he attributed to melting snow. A time or two he had a break down, and was once delayed two weeks in getting machinery for a return trip. He could not have made the trip at ordinary stage of water. The venture proved unsuccessful, and the boat was sold and used as a ferry. There were no other attempts at navigation in the locality, although there were some boats there, and from his experience, he would not say that the river is navigable from Tulsa to Pawnee County, without considerable work on it. Another resident of Cleveland rafted logs fastened with cross poles, two miles to mill, on a two foot rise, and ran a ferry near town, and other small boats, with fair success when the water was up, and at ordinary stage by keeping the channel and occasionally pulling the boat from the sand bars. An account was given by an oil field employee of a trip early in 1908 by two parties from Cleveland to Vicksburg, in a gasoline boat, 26 feet long, with six foot beam, drawing 18 inches, on low water; meeting local rains enroute, during a period of three months, stopping at different points, but without disclosure of conditions encountered.

A farmer and stockman near Cleveland since 1883 took a raft of 350 cedar logs, lashed with wire, down to Tulsa, on an eight foot rise, but stated that he never knew of any successful effort to navigate the river for commercial purposes. He recalled that the "Arkansas Miller" made one trip down the river with a load of grain and flour, and on returning with lumber ran aground and was wrecked at the mouth
828 of Black Bear. In his opinion, only a very light boat could run on the river at usual stage or not on a rise from recent snow or rain, and in low water no boat could run through Pawnee County. He was with engineer Burrows, in the survey of the river from Wichita to Fort Gibson, until he reached Tulsa. Two flat boats lashed together were used, which had to be unloaded and dragged over the sand bars at low places.

At Arkansas City, before the Santa Fe railroad was built there, the interest centered in promoting the improvement of

the river and considerable efforts were exerted to make a showing that it was or could be made available for commercial use. A reward of \$700 was offered to the first boat (but not paid). With the inducement in view, the witness Chapman, heretofore referred to, made the trip from Little Rock to Arkansas City, in 1876, with the "Aunt Sally", which was built by him. The boat had about twenty horse power, and drew 16 inches, light, and two feet loaded. There had been a flood and he ran only in the day time, meeting two or three pretty [food] rises, affording ample water, estimated to be 20 feet at Arkansas City. He returned on the current, without a load, going aground once or twice, the river then falling. He ran excursions at Arkansas City, going 7 miles up the Walnut River which had 5 or 6 feet of water at the mouth but receded before he left. The boat was photographed on July 4th, with a band and 360 people aboard. The scheme, he thought, was to stimulate extension of the railroad from Wichita.

A retired farmer at Arkansas City recalled the trip of the "Aunt Sally", and stated that several boats were built there in the seventies, before the railroad came. One of them was the "Arkansas Miller," and another perhaps the "Cherokee," on which threshing machine power was installed. The boats were said to have gone south to Arkansas. He did not know that they went above Arkansas City. In 1877, he rafted from Wichita enough lumber to build two churches.
829 and several dwellings, and steel for a [brifge] over Walnut River. The trip was due to necessity and was made when the water was at its highest. The witness did not know [on] any commercial use of the river below Arkansas City, and no effort at navigation occurred after the railroad was built there. The "Aunt Sally" was probably the boat referred to by engineer Burrows in 1884. It never returned. The "Cherokee" was built for taking down flour and grain in medium stage of water. After harvest, wheat and flour were hauled, by using good judgment. The flat boats did not go on low water, but he thought they could have gone at medium stage. He considered that forty years ago the Arkansas was the main stream of Kansas. It was described as being broad and filled with sand bars. His own experience was limited to crossing on ferry boats. It was not the habit of the people of Arkansas City to bring merchandise on the river from Wichita. He thought some of the boats ran in ordinary water; but had the impression that the river had less water than in the seventies; and after the settlement of the west,

due to the taking of water in Colorado for irrigation, and to soil cultivation. Since 1893, there was no practical use of the river for trade and commerce, and it was not possible to navigate it during the last twenty years except at high water, but small flats might go down the main channel.

A merchant there recalled the "Aunt Sally," the "Kansas Millers," "Cherokee" and other boats in that locality. From his account, the "Cherokee" was built there, and the "Kansas Millers" partly there and partly a few miles north. The "Cherokee" went down the river and he did not know what became of it. The "Arkansas Miller" also went down. He thought the "Kansas Miller" was loaded with wheat and flour and that the others also took merchandise down the stream. No use was being made of the stream, except for pleasure boats—small gasoline launches. He supposed the "Kansas Millers" and the "Cherokee" were an experiment. He knew of no boats that came up except the "Aunt Sally," and 830 probably none of the boats could have floated in the ordinary stage of the river, when not affected by snows or rain. The four were the only boats put on the river for trade and commerce, and he could not answer whether they were regarded as successful. In the seventies and eighties, almost any boat could go at half stage of high water for four or five months in spring seasons, which varied in length. His testimony was not as to the condition of the river in Pawnee County.

A newspaper man of Pawnee, formerly of Arkansas City, testified that it was thought the river was navigable three or four months a year, but not in winter for such boats as the "Aunt Sally", and the installing of a line of boats a question of time. In 1878, 1879, and 1880, the river was understood to be generally used for flat boats and barges to Fort Gibson and above as the stage of water permitted. He believed another boat built near Arkansas City went down but did not know whether it tried to return, and thought the boat and cargo were sold. The use of the river for trade and travel in Pawnee County was from his acquaintance only in very isolated instances at times of high water, and the attempted navigation at the time of the "Aunt Sally" was largely an experiment. As a matter of encouragement flour and stuff were shipped down the river. The general belief in the locality was that with a little assistance by appropriations it was possible by dredging to make the river navigable, and it was hoped to attract the attention of Congress to the river there, but the appropriation was not made and the Santa Fe railroad was

built. His account was that in spring and summer when the snows melted, the river was higher, and generally overflowed the town, but thought the trip of the "Aunt Sally" was in the ordinary spring and summer water, and that they could ordinarily depend on it.

831 M. M. Murdock, of Wichita, was an original advocate of the appropriations for the river project and a water route as affecting freight rates. He had assurance from one of the engineers that a channel could be made to Arkansas City, sufficient for light boats. From his account, boats were built, a flat boat, equipped at Arkansas City with a saw-mill engine, went to Wichita and back in 1870, lumber was hauled in the early days to Arkansas City, boats came down from Colorado, and perhaps flour or something was shipped down in the flats. No boat got back or went with that idea. In his judgment, the river was not navigable for any practical purpose before or after the water was taken out. After quoting General Grant, while a lieutenant, as having said that the river would be navigable, if copper-lined, he added: "I guess he was about right, because I know how shifting those sands are". The testimony of a witness was to the effect that in the old days there was high water which the banks took care of, that the river (point not shown) was originally a large stream, averaging a thousand feet from bank to bank, at times covered with water, that the bed was [composes] of loose sand that blew when dry, and was taken out by high water, when the river shifted from side to side. Another witness stated that dredging operations by the Government (point also not shown) failed of success, for want of water.

This river has certain known characteristics. It is 2,000 miles long, second in importance as a tributary of the Mississippi, an outlet for a great area, and it is navigable probably 600 miles from its mouth. But it has a winding course, broad channel, and a bed of sand which moves and lodges with the currents. There are accounts, not free of conflict with others, of its use to an extent for transportation in Kansas and south from Arkansas City. But whatever weight may be due to known facts or reputed matters, tending to show that the river is or ever was navigable in fact above the mouth of Grand River in this state, it is certainly overcome by explicit proof.

832 The prevailing and ultimate opinions of the engineers present a strong showing of expert evidence from an accurate source against the navigability of the river in

fact at any time above that point. It is substantially confirmed by the pilots, boatmen, and others from observation and experience. The use of that portion of the river for transportation boats has been exceptional and necessarily on high water, was found impractical, and was abandoned. The rafting of logs or freight has been attended with difficulties precluding utility. There was no practical susceptibility to use as a highway of trade or travel. The legislation and public acts are deemed insufficient to make out navigability. The Departments of War and the Interior concur in a holding against it. To conclude upon the record and the relevant facts entitled to consideration that the Arkansas River is or ever has been navigable above Grand River in Oklahoma would be to sustain a theory against a fact.

By the tests given in controlling authority, but one finding is justified in this case, and that is, that it is clearly established that such portion of the Arkansas River is not and has not been navigable, and hence that it is not and has not been navigable along the south boundary of the Osage reservation and at the particular locations here in controversy.

Such finding will be made. It follows, as a matter of law, that the Osage tribe acquired the title to the river bed to the middle of the main channel along the south boundary of its reservation, now Osage County, and at the location in controversy, and thereby became and is the sole owner of the underlying oil, gas and other minerals, and that the United States holds the title to such portion of the river bed and said minerals in trust for the tribe, subject to lease only for its benefit, and as provided by law, and that the defendant lessees and the interveners have no right, title or interest in or to said portion of the river bed or the minerals therein.

833 A decree will be entered to that effect, and quieting the title of the tribe and the plaintiff, as its trustee, to said portion of the river bed and minerals, and further that the receiver be ordered to pay to the United States in trust for the tribe the net funds heretofore and hereafter realized by him from the oil and gas therefrom, and that the lessees and interveners be denied any portion of said funds and be perpetually enjoined from prospecting for or taking oil, gas or other minerals from such portion of the river bed, and that the leases here in question to that extent be cancelled and held for naught.

The cause will be retained for the purpose of settling and paying the costs and charges of the receivership and appor-

tioning to the plaintiff for the tribe its interest in the funds of the receiver, and for the ascertainment of the rightful claimants and owners of the residue thereof, and the apportionment and payment to them of the same, and further for the purpose of taxing all costs herein, and the making of all proper future orders; and in the meantime, and during the pendency of any and all appeals in this cause, the receiver will be continued as heretofore directed, subject to future orders.

February 21, 1918.

JOHN H. COTTERAL,
District Judge.

Endorsed: Filed in the District Court on February 21, 1918.

834 (Order, that Findings of Fact in the Opinion be adopted as the Findings of Fact by the Court.)

It is this day ordered that the findings as contained in the written opinion filed on the rendition of the final decree in the above entitled cause be and the same are adopted as the findings of fact by the court therein.

February 21, 1918.

JOHN H. COTTERAL,
District Judge.

Endorsed: Filed in the District Court on February 21, 1918.

835 (Decree of the District Court, February 21, 1918.)

United States of America, Plaintiff,
No. 75. vs. In Equity.

Brewer-Elliott Oil & Gas Company, et al., Defendants.

On this twenty first day of February, 1918, the said cause comes on for final determination, after having been fully tried and submitted, and upon consideration thereof, and the arguments of counsel, it is by the court,

Ordered, adjudged and decreed, that the Osage tribe of Indians in Oklahoma acquired, as a part of its reservation, the title to the bed of the Arkansas River, lying adjacent to the lands of said reservation, in the State of Oklahoma, as far as and extending to the middle of the main channel of said river, together with the underlying oil, gas and other minerals, by virtue of the Act of Congress approved June 5, 1872, and as confirmed by the deed of the Cherokee Nation of Indians,

dated June 14, 1883, that the title to said portion of said river bed and said minerals are subject to lease only for the benefit of said tribe, as provided by the laws of the United States, and as may be hereafter provided by said law, and that the said title of the said tribe and the United States as its trustee, should be and is hereby quieted. And it is further by the court,

Ordered, adjudged and decreed, that the defendant lessees and their sub-lessees, assignees and successors in interest and the interveners herein, and each of them, have no right, title or interest to or in said portion of said river bed or minerals, and that the leases therefor of the defendant companies and their sub-lessees, assignees and successors from the state of Oklahoma and its officers and agents involved in this cause be and they are hereby cancelled and held for naught. And it is further by the court,

836 Ordered, adjudged and decreed, that the net funds which have been and may hereafter be realized by the receiver herein from the oil and gas in said premises belong to, and be paid by him to, the United States in trust for said tribe, and that the said lessees and their sub-lessees, assignees and successors and said intervenors be denied any part thereof, and in addition be and they are hereby enjoined from prospecting for or taking oil, gas, or other minerals from said portion of said river bed, except in accordance with the orders for operation and payment under and in connection with the receivership in this cause, and for the preservation of said funds. And it is further by the court,

Ordered, adjudged and decreed, that this cause be retained for the purpose of settling and paying the costs and charges of the said receivership and apportioning to the plaintiff for the tribe its interest in the funds of the said receiver, and for the ascertainment of the rightful claimants and owners of the residue thereof, and the apportionment and payment to them of the same, and further for the purpose of taxing all costs herein, and the making of all proper future orders, and that in the meantime, and during the pendency of any and all appeals in this cause, the receiver be continued in his duties as heretofore directed, subject to future orders.

To the said decree, and every part thereof, and to each and every of the above findings and orders the parties defendant and interveners and each of them separately and jointly, at

the time excepted and except; and said exceptions are allowed:

Approved:

JOHN H. COTTERAL,
District Judge.

(Endorsed Filed in the District Court on February 21, 1918.)

837

Motion for Severance.

United States of America, Plaintiff,
No. 75 vs. In Equity.

The Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; The Scioto Oil Company, a corporation; the Gypsy Oil Company, a corporation; and C. J. Haskell, Defendants.

The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, Interveners.

To the Honorable John H. Cotteral, Judge of the United States District Court for the Western District of Oklahoma:

Now come the defendants, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the intervenors, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and conceiving themselves aggrieved by the final decree, order and judgment entered in the above numbered and entitled cause on the 21st day of February, 1918, here respectfully represent that they desire to appeal from said final decree, order and judgment to the Circuit Court of Appeals for Eighth Circuit; and further respectfully represent that the Scioto Oil Company, one of the defendants herein, has been notified of the intention of said defendants and intervenors to appeal from said final decree, order and judgment and has been requested to join in said appeal, and said Scioto Oil Company has refused to join in said appeal; also that a copy of said notice to said Scioto Oil Company, together with the refusal of the Scioto Oil Company to join in said appeal, is hereto attached marked Exhibit "A", and made a part of this motion.

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Wherefore, said defendants, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and said Intervenors, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, pray that a severance be granted herein and that they be permitted to prosecute said appeal separately and independent of any appeal on the part of said Scioto Oil Company.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Brewer-
Elliott Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Pawnee-
Osage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Chickos-
age Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Number
One Oil Co.

A. T. BOYS,
Attorney for Arkansas River Bed Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for C. J. Has-
kell.

S. P. FREELING,
Attorney General of the State of Okla-
homa,
Attorney for the State of Oklahoma, In-
tervenor.

S. P. FREELING,
Attorney General of the State of Okla-
homa,
Attorney for the Commissioners of the
Land Office of the State of Oklahoma, In-
tervenors.

839

Exhibit A.**Request To Join In Appeal.**

The Scioto Oil Company, a corporation, one of the defendants in the above numbered and entitled cause, is hereby notified that the undersigned defendants, Brewer-Elliott Oil & Gas Company, Pawnee-Osage Oil & Gas Company, Chickosage Oil & Gas Company, Number One Oil Company, Arkansas River Bed Oil & Gas Company, and C. J. Haskell, and the intervenors, State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma conceive themselves aggrieved by the final decree, order and judgment entered in the above entitled cause entered on the 21st day of February, A. D., 1918, and intend to appeal from said final order and judgment to the Circuit Court of Appeals for the Eighth Circuit and the said Scioto Oil Company is hereby notified of such intention and is requested to join in such appeal.

The said Scioto Oil Company is hereby notified that if it refuses to join in said appeal on or before the 19th day of August, 1918, the undersigned defendants and intervenors will apply to the Judge of the United States District Court for the Western District of Oklahoma, for a severance and for permission to prosecute said appeal without the said Scioto Oil Company, joining in the same.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Brewer-Elliott Oil & Gas Co.

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LEDBETTER, STUART & BELL
By H. L. Stuart, Attorneys for Pawnee-Osage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for Number One Oil Co.

A. T. BOYS,
Attorney for Arkansas River Bed Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney General of the State of Oklahoma,
Attorney for the State of Oklahoma, Intervenor

S. P. FREELING,
Attorney General for the State of Oklahoma,
Attorney for the Commissioners of the Land Office of the State of Oklahoma, Intervenor.

Receipt of a copy of the above and foregoing request on this the 16th day of August, 1918, is acknowledged and the undersigned Scioto Oil Company, refuses to join in said appeal.

EDW. H. CHANDLER,
Attorney for the Scioto Oil Company.

(Endorsed: Filed in the District Court on August 20, 1918.)

Order Allowing Severance.

On this the 20th day of August, 1918, there was presented to the undersigned, John H. Cottrel, Judge of the United States District Court for the Western District of Oklahoma, the motion of the defendants, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; and C. J. Haskell, and the intervenors, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, asking for a severance herein and asking for the right to prosecute an appeal from the final order, decree and judgment rendered in the above numbered and entitled cause on the 21st day of February 1918, to the Circuit Court of Appeals for the Eighth Circuit without the defendant Scioto Oil Company, participating or joining in said appeal, there being attached to said motion a copy of a request in writing made by said defendants and said intervenors to said Scioto Oil Company to join in said appeal, there being endorsed on said copy of said request a copy of the refusal of said Scioto Oil Company to join in said appeal and the undersigned.

842 Judge of the United States District Court for the Western District of Oklahoma, being fully advised in

the premises, finds that said motion for a severance should be granted and it is hereby

Ordered, adjudged and decreed, that said defendants the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; and C. J. Haskell, and the Intervenor, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, are hereby authorized and permitted to prosecute their appeal from said final order, decree and judgment of February 21, 1918, to the Circuit Court of Appeals for the Eighth Circuit, separately and independent of said Scioto Oil Company and without said Scioto Oil Company participating or joining in said appeal.

Given under my hand at Guthrie, Oklahoma, in the Western District of the State of Oklahoma, on this the 20th day of August, 1918.

JOHN H. COTTERAL,
Judge of the U. S. District Court for the
Western District of Oklahoma.

(Endorsed: Filed in the District Court on August 20, 1918.)

843

Petition For Appeal.

To the Honorable John H. Cotteral, Judge of the United States District Court for the Western District of Oklahoma:

Now come the following defendants in the above cause, Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and conceiving themselves aggrieved by the final order, decree, and judgment entered in the above entitled cause on the 21st day of February, 1918, hereby appeal from said final order, decree, and judgment and the said defendants, Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River

Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the said intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, pray that this, their appeal to the Circuit Court of Appeals for the Eighth Circuit, may be allowed and that a transcript of the record and proceedings and the papers upon
 844 which said final order, decree, and judgment was made and duly authenticated, may be sent to the United States Circuit Court of Appeals for the Eighth Circuit.

The said defendants, Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and said intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, also ask that an order be made and entered fixing the amount of security which said defendants and said intervenors will be required to furnish on said appeal.

Said defendants and said intervenors herewith submit their assignment of errors.

LEDBETTER, STUART & BELL,
 By H. L. Stuart, Attorneys for Brewer-Elliott Oil & Gas Co.

LEDBETTER, STUART & BELL,
 By H. L. Stuart, Attorneys for Pawnee-Osage Oil & Gas Co.

LEDBETTER, STUART & BELL,
 By H. L. Stuart, Attorneys for Chickosage Oil & Gas Co.

LEDBETTER, STUART & BELL,
 By H. L. Stuart, Attorneys for Number One Oil Co.

A. T. BOYS,
 Attorneys for Arkansas River Bed Oil & Gas Company.

LEDBETTER, STUART & BELL,
 By H. L. Stuart, Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of Oklahoma,
Attorney for the State of Oklahoma, Intervenor.

S. P. FREELING,
Attorney-General of the State of Oklahoma,
Attorney for the Commissioners of the Land Office of the State of Oklahoma, Intervenor.

(Endorsed: Filed in the District Court on Aug. 20, 1918.)

845

Assignment of Errors.

Now come the defendants, the Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the intervenors, The State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and respectfully allege that the following errors occurred in the proceedings and the final decree in the above styled cause in the United States District Court for the Western District of Oklahoma:

I.

The Court erred in finding and holding that the Arkansas River was not navigable at the location of the leases in controversy in this cause.

II.

The Court erred in finding and holding that the Arkansas River was not navigable above the mouth of Grand River.

III.

The Court erred in finding and holding that the Arkansas River was not navigable throughout the whole State of Oklahoma.

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IV.

The Court erred in finding and holding that the issue of navigability is one of fact only and that a river is not navigable unless so in fact.

V.

The Court erred in finding and holding in the following part of his opinion (Which opinion was adopted by him as his findings of fact), reading as follows:

"The issue of navigability is one of fact. The purely "legal test" cannot be accepted. A river is not navigable, unless so in fact. It will be deemed navigable, when used or susceptible of use in its ordinary condition, as a highway of trade and travel in the customary modes on water."

VI.

The Court erred in not finding and holding that the Arkansas River above the mouth of Grand River and particularly at the location of the leases in controversy was navigable in law under the facts and circumstances of this case.

VII.

The Court erred in holding and finding that the Arkansas River was not navigable at the location of the leases in controversy, in particular and above the mouth of Grand River, because the clear weight and preponderance of the evidence showed that said River was a navigable water of the United States of America at the location of the leases in controversy in particular and above the mouth of Grand River.

VIII.

The judgment and decree of the Court in favor of the United States and against these appellants, to-wit: the Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, C. J. Haskell, and the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma,
 847 was erroneous in that it was contrary to the clear preponderance of the controlling evidence. The clear preponderance of the controlling evidence showed that said River was navigable above the mouth of Grand River and at the location of the leases in particular.

IX.

The Court erred in rendering judgment for the complainant, United States of America. Under the evidence in this case judgment should have been rendered against the United

States of America, denying it any relief under its Bill of Complaint herein.

X.

The Court erred in holding that the title to the bed of the Arkansas River below high water mark and the title and ownership of the oil and gas rights was and is in the Osage Tribe of Indians at the location of the leases in controversy herein and likewise erred in holding that the Osage Tribe of Indians held and owned the title to the bed of the Arkansas River below high water mark, as well as the oil and gas rights therein as the riparian owner of the adjacent land on the east or north bank of said River.

XI.

The Court erred in not holding that the title to the bed of the Arkansas River throughout the State of Oklahoma and particularly at the location of the leases in controversy herein below the high water mark on either side of said river was in the State of Oklahoma.

XII.

The Court erred in refusing to follow and be bound by the decision of the Supreme Court of the State of Oklahoma in the case of State vs. Nolegs, 40 Okla. 479; 139 Pac. 943, wherein the Supreme Court of the State of Oklahoma held and adjudged that the Arkansas River throughout the State of Oklahoma is a navigable stream and that the title to the bed of said River is in the State of Oklahoma.

848 Wherefore; the said Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, C. J. Haskell, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, appellants in this appeal pray that said decree of the United States District Court for the Western District of Oklahoma be reversed, set aside, and held for naught and the proper judgment rendered and entered for these appellants.

LEDBETTER, STUART & BELL,

By H. L. Stuart, Attorneys for
Brewer-Elliott Oil & Gas Co.

LEDBETTER, STUART & BELL,

By H. L. Stuart, Attorneys for
Pawnee-Osage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Chickosage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Number One Oil Co.

A. T. BOYS,
Attorneys for Arkansas River Bed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the State of Oklahoma,
Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma, Attorney for the Com-
missioners of the Land Office of the
State of Oklahoma, Intervenors.

Endorsed: Filed in the District Court on August 20, 1918.

849 (Order allowing Appeal and fixing the amount of Ap-
peal Bond.)

On this the 20th day of August, 1918, at Guthrie, in the Western District of Oklahoma, came on to be heard the petition of the defendants, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; and C. J. Haskell, and the intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, for an appeal to the United States Circuit Court of Appeals for the Eighth Circuit, said petition being presented at said Guthrie to the undersigned Judge of the United States District Court for the Western District of Oklahoma, said petition also asked that an order be made and entered fixing the amount of security which said defendants and said intervenors will be required

to furnish on said appeal. Said defendants and said intervenors also submitted their assignments of error.

Said petition for such appeal is allowed. It is therefore ordered, adjudged and decreed that said petition for an appeal be and the same is hereby allowed as prayed for.

It is further ordered, adjudged and decreed that said defendants and said intervenors give security in the sum of \$1000.00, the same to operate as a cost bond only.

JOHN H. COTTERAL,
Judge of the United States District Court
for the Western District of Oklahoma.

Endorsed: Filed in the District Court on August 20, 1918.

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(Bond on Appeal.)

Know All Men By These Presents: That we, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; C. J. Haskell, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, as principals and the other subscribers hereto as surety, are held and firmly bound unto the United States of America and the Gypsy Oil Company, a corporation, in the sum of One Thousand Dollars (\$1000.00) to be paid to said United States of America and said Gypsy Oil Company, or their legal representatives, for the payment of which well and truly to be made, we bind ourselves, and each of us jointly and severally and each of [out] successors, representatives, and assigns firmly by these presents.

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Sealed with our seals and [date] this 20th day of [of] August, 1918.

Whereas, the above named Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, have taken an appeal to the United States Circuit Court of Appeals to reverse a decree entered on the 21st day of February, 1918, in a cause wherein

the said United States of America, is complainant, and the above named Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; C. J. Haskell and the Gypsy Oil Company, are defendants, and the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, are intervenors, in the United States District Court for the Western District of Oklahoma, now, therefore, the condition of this obligation is such that if said Brewer-Elliott Oil & Gas Company, Pawnee-Osage Oil & Gas Company, Chickosage Oil & Gas Company, Number One Oil Company, Arkansas River Bed Oil & Gas Company, C. J. Haskell, the State of Oklahoma and the Commissioner of the Land Office of the State of Oklahoma, will prosecute said appeal with effect and answer and pay all costs, if they fail to make good their plea, then this obligation shall be void, otherwise to remain in full force and effect.

**BREWER-ELLIOTT OIL &
GAS COMPANY,**

By H. L. Stuart, Attorney.

**PAWNEE-OSAGE OIL &
GAS COMPANY,**

By H. L. Stuart, Attorney.

**CHICKOSAGE OIL & GAS
COMPANY,**

By H. L. Stuart, Attorney.

**NUMBER ONE OIL
COMPANY,**

By H. L. Stuart, Attorney.

**ARKANSAS RIVER BED
OIL & GAS COMPANY,**

By A. T. Boys, Attorney.

C. J. HASKELL,

By H. L. Stuart, Attorney.

**THE STATE OF
OKLAHOMA,**

By S. P. Freeling, Attorney
General of the State of
Oklahoma, Attorney.

THE COMMISSIONER OF
THE LAND OFFICE OF THE
STATE OF OKLAHOMA,
By S. P. Freeling, Attorney
General of the State of
Oklahoma, Attorney.

Principals.

NEW AMSTERDAM
CASUALTY COMPANY,
By L. N. Beadles, Attorney in
fact, Surety.

(Seal)

Approved this August 20, 1918.

John H. Cotteral,
U. S. District Judge.
Western District of Oklahoma.

Endorsed: Filed in the District Court on August 20, 1918.

854

(Praeceptum for Transcript.)

The Clerk of the United States District Court for the Western District of Oklahoma is hereby notified that the appellants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, C. J. Haskell, State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, desire the following instruments and orders incorporated into the transcript on their appeal herein to the United States Circuit Court of Appeals for the Eighth Circuit, to-wit:

1. Bill of Complaint.
2. Plea of Intervention of State of Oklahoma and Commissioners of the Land Office.
3. Answer of the Arkansas River Bed Oil & Gas Company.
4. Answer of the Brewer-Elliott Oil & Gas Company.
5. Answer of the Chickosage Oil & Gas Company.
6. Answer of the Pawnee-Osage Oil & Gas Company.
7. Stipulations filed June 11, 1914.
8. Order Appointing Receiver filed June 15, 1914.

9. Reply to Answer of Pawnee-Osage Oil & Gas Company.
10. Reply to Intervention of State of Oklahoma and Commissioners of the Land Office.
- 855 11. Answer of Scioto Oil Company.
12. Cross Bill and Counter-Claim of Scioto Oil Company.
13. Answer of Gypsy Oil Company to Cross-Bill of Scioto Oil Company.
14. Stipulation filed December 6, 1915.
15. Stipulation filed December 26, 1916.
16. Motion filed December 26, 1916.
17. Order Discharging Receiver filed January 25, 1917.
18. Motion of C. J. Haskell to Be Made Party Defendant.
19. Order Allowing C. J. Haskell to be Made Party Defendant.
20. Answer of C. J. Haskell.
21. Order Showing Submission and Closing of Testimony.
22. Statement of Facts.
23. Opinion.
24. Order Making Findings in Opinion Findings of Fact by the Court.
25. Final Decree.
26. Motion for Severance With Request to Join in Appeal Attached.
27. Order Allowing Severance.
28. Petition for Appeal.
29. Assignment of Errors.
30. Order Allowing Appeal.
31. Appeal Bond.
32. Citation and Acceptance of Service.
33. Applications for an Enlargement of Time.
34. Orders Allowing Enlargement of Time.
35. This Praecipe with Acceptance of Service Thereon.

36. Certificate of Clerk.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Brewer-Elliott Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Pawnee-Osage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Chickosage Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
Number One Oil Company.

856

A. T. BOYS,
Attorney for Arkansas Riverbed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart, Attorneys for
C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma, Attorney for the State
of Oklahoma, Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma, Attorney for the Com-
missioners of the Land Office of the
State of Oklahoma, Intervenors.

The plaintiff, United States of America, and the defendant,
Gypsy Oil Company, hereby accept service and acknowledge
notice of the above Praecipe.

Dated this the 16th day of October, 1918.

JOHN A. FAIN,
United States District Attorney for the
Western District of Oklahoma, Attorney
for the United States of America.

JAMES B. DIGGS,
Attorney for the Gypsy Oil Company.

Endorsed: Filed in the District Court on October 18, 1918.

857 (Application for enlargement of Time to File Transcript.)

To the Honorable John H. Cotteral, Judge of the United States District Court for the Western District of Oklahoma:

Now come the defendants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas Riverbed Oil & Gas Company, a corporation, and C. J. Haskell, and the intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and respectfully allege that on the 20th day of August, 1918, an appeal was allowed by the Honorable John H. Cotteral, Judge of the United States District Court for the Western District of Oklahoma, to these defendants and intervenors from the final judgment and decree rendered herein on the 21st day of February, 1918, and that on said 20th day of August, 1918, the said Honorable John H. Cotteral issued a citation, citing and admonishing the plaintiff in this cause, the United States of America, to appear in the United States Circuit Court of Appeals for the Eighth Circuit in the City of St. Louis, Missouri, sixty days from and after said citation bore date, to-wit, the 20th day of August, 1918, and that under the rules of said United States Circuit Court of Appeals this case must be docketed and the record thereof filed with the Clerk of said United States Circuit Court of Appeals by or before said October 19, 1918.

These defendants and intervenors respectfully represent that the record in this cause is a very long and bulky
 858 one, that the testimony is very voluminous, consisting of depositions, official documents, oral testimony of witnesses, and testimony of other kinds, and that on that account an enlargement of time in which to file and lodge the record of this cause with the Clerk of the United States Circuit Court of Appeals at St. Louis, Missouri, by or before the return day, to-wit, the 19th day of October, 1918, is necessary.

These defendants and intervenors further represent that on account of the length and bulk of the record of this case and on account of the very large amount of testimony that was introduced on the trial of this case, an enlargement of the time in which said case may be docketed and the record thereof filed with the Clerk of the United States Circuit Court of Appeals, (which, under the order granting said appeal here-

in, must be done by or before the 19th day of October, 1918,) for the period of sixty days is reasonably necessary and these appealing defendants and intervenors should be allowed sixty days additional to the said time allowed in which to file said record and docket said case, and that these defendants and intervenors should be allowed until the 18th day of December, 1918, in which to docket this case and file the record thereof with the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit.

Wherefore: These defendants and intervenors pray that they be granted an enlargement of time herein in which to docket said case and file the record thereof with the Clerk of said United States Circuit Court of Appeals, that they be granted an enlargement of time for the purpose of docketing said case and filing said record for the period of sixty days, and that Your Honor grant and make an order enlarging and extending the time for the docketing of said case and the filing of said record in said United States Circuit Court of Appeals until the 18th day of December, 1918.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Brewer-Elliott Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Pawnee-Osage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Chickosage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Number One Oil Co.

859

A. T. BOYS
Attorney for Arkansas Riverbed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the State of Okla-
homa, Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the Commissioners of
the Land Office of the State of Ok-
lahoma, Intervenor.

Endorsed: Filed in the District Court on October 1, 1918.

860 (Order, October 3, 1918, enlarging time to File Tran-
script.)

It is this day ordered, for cause appearing, that the time in which the defendants, Brewer-Elliott Oil & Gas Company, Pawnee-Osage Oil & Gas Company, Chickosage Oil & Gas Company, Number One Oil Company, Arkansas River Bed Oil & Gas Company, and the C. J. Haskell and the intervenors, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and each of said parties and the appellants in said cause may lodge [thrie] record in the Circuit Court of Appeals for the Eighth Circuit, and docket their appeal thereon, be and it is enlarged and extended for thirty days from and after October 19, 1918.

October 3, 1918.

JOHN H. COTTERAL,
District Judge.

Endorsed: Filed in the District Court on October 3, 1918.

861 (Application for enlargement of Time to file Tran-
script.)

To the Honorable Judges of the United States District
Court for the Western District of Oklahoma:

Now come the appealing defendants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the appealing intervenors, The State of Oklahoma, and the Commissioners of the Land Office of the State of

Oklahoma, and respectfully represent that on account of unavoidable circumstances and on account of the record in this cause being a very large one on account of the testimony taken on the trial of this cause being very voluminous, consisting of depositions, official documents, oral testimony, and evidence of other nature, it will be impossible for appellants to lodge the record of this cause with the Clerk of the United States Circuit Court of Appeals of St. Louis, Missouri, by or before the 19th day of November, 1918, the date on which the enlargement of time heretofore granted expires.

Said appealing defendants and intervenors further respectfully represent that the appellants in the appeal being prosecuted from the judgment in Cause No. 839 on the equity docket, styled the United States vs. G. W. Hutchings, et al, have until the 28th day of December, 1918, in which to file said record with the Clerk of said Circuit Court of Appeals; that this cause and said Cause No. 839 were both tried together and were consolidated for the purpose of trial in the
862 District Court of the United States for the Western District of Oklahoma.

Wherefore: These appealing defendants and intervenors pray that they be granted an additional enlargement of time in which to docket said appeal and file the record thereof with the Clerk of United States Circuit Court of Appeals until the 28th day of December, 1918, and that an order enlarging and extending the time for the docketing of this appeal and the filing of the record in said United States Circuit Court of Appeals until the 28th day of December, 1918, be made and entered.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Brewer-Elliott Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Pawnee-Osage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Chickosage Oil & Gas
Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Number One Oil Co.

A. T. BOYS,
Attorney for Arkansas Riverbed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma.
Attorney for the State of Okla-
homa, Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma.
Attorney for the Commissioners of
the Land Office of the State of Ok-
lahoma, Intervenors.

Endorsed: Filed in the District Court on November 8, 1918.

863 (Order November 11, 1918, enlarging time to file Tran-
script.)

On application of appealing defendants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and appealing intervenors, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, it is ordered that said appealing defendants and intervenors be granted an extension of time until the 28th day of December, 1918, in which to file this case and the record thereof on appeal with the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit in the city of St. Louis, Missouri.

Dated this the 11th day of November, 1918.

JOHN H. COTTERAL,
Judge.

Endorsed: Filed in the District Court on November 11, 1918.

864 (Application for enlargement of Time to File Transcript.)

To the Honorable Judge of the United States Circuit Court of Appeals for the Eighth Circuit:

Now come the appealing defendants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the appealing intervenors, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and respectfully represent that on account of unavoidable circumstances and on account of the record in this cause being a very large one on account of the testimony taken on the trial of this cause being very voluminous, consisting of depositions, official documents, plats, maps, oral testimony, and evidence of other nature, and on account of the delay caused by the influenza epidemic that has prevailed in Oklahoma, it will be impossible for appellants to lodge the record of this cause with the Clerk of the United States Circuit Court of Appeals of St. Louis, Missouri, by or before the 28th day of December, 1918, the date on which the enlargement of time heretofore granted expires.

865 Appellants further represent that the record on this appeal, which has been reduced by them, is, when reduced, still a voluminous one, that it has been necessary to set out in said record exhibits of length that could not be abridged, that it has also been necessary to have copies made of the plats and maps that were introduced in evidence, and that on account of these facts, it will be reasonably necessary for an extension of 90 days from the 28th day of December, 1918, to be granted these appellants in which to file said record and docket this appeal with the Clerk of the United States Circuit Court of Appeals and these appellants should be allowed until the 28th day of March, 1919 in which to docket this cause and file the record thereof with the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit at St. Louis, Missouri.

Said appealing defendants and intervenors further respectfully represent that this cause was tried in the United States District Court at the same time and along with Cause No. 839 on the equity docket of said United States District Court, styled the United States vs. G. W. Hutchings, et al., this cause and said cause No. 839 having been consoli-

dated on the trial, that an appeal from the judgment in said cause No. 839 is also being prosecuted and Honorable Ralph E. Campbell, who signed the citation on the appeal in said cause No. 839, has resigned from office, that the time for the filing of the record on the appeal in said cause No. 839 expires on the 29th day of December, 1918, and that Judge John H. Cotteral, who signed the citation on appeal in this cause is now at Rochester, Minn., on account of his wife having been seriously ill and requiring medical attention.

Wherefore: These appealing defendants and intervenors pray that they be granted an additional enlargement of time in which to docket said appeal and file the record thereof with the Clerk of the United States Circuit Court 866 of Appeals until the 28th day of March, 1919, and that an order enlarging and extending the time for the docketing of this appeal and the filing of the record in said United States Circuit Court of Appeals until the 28th day of March, 1919, be made and entered.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Brewer-Elliott Oil
& Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Pawnee-Osage Oil
& Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Chickosage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for Number One Oil Co.

A. T. BOYS,
Attorney for Arkansas River Bed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
By H. L. Stuart,
Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the State of Okla-
homa, Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the Commissioners
of the Land Office of the State of
Oklahoma, Intervenor.

Endorsed: Filed in the District Court on December 19,
1918.

867 (Order, December 26, 1918, enlarging Time to File
Transcript.)

On this the 26th day of December, 1918, there was pre-
sented to the undersigned, one of the Judges of the United
States Circuit Court of Appeals for the Eighth Circuit, the
application of appealing defendants, Brewer-Elliott Oil &
Gas Company, a corporation, Pawnee-Osage Oil & Gas Com-
pany, a corporation, Chickosage Oil & Gas Company, a cor-
poration, Number One Oil Company, a corporation, Arkansas
River Bed Oil & Gas Company, a corporation, and C. J. Hask-
ell, and appealing intervenors, the State of Oklahoma and the
Commissioners of the Land Office of the State of Oklahoma,
for an additional enlargement of time in which said appealing
defendants and intervenors, under the rules of the United
States Circuit Court of Appeals for the Eighth Circuit, can
docket said appeal and file the record in this cause with the
Clerk of said United States Circuit Court of Appeals,
868 which time expires on the 28th day of December, 1918.

It appearing that good cause exists and is shown
for the granting of the enlargement of time asked for in said
application.

It is Ordered and Decreed that said application be and the
same is hereby granted, that an enlargement of time of
ninety days from the 28th day of December, 1918, is hereby
granted said appellants in which to docket said appeal and file
the record herein with the Clerk of the United States Cir-
cuit Court of Appeals in the City of St. Louis, Missouri, and
said appellants are hereby granted an extension and enlarge-
ment of time for the docketing of said case and filing said

record until the 28th day of March, 1919, and that the case can be docketed and said record filed in said United States Circuit Court of Appeals with the Clerk of said United States Circuit Court of Appeals by or before the 28th day of March, 1919.

WILLIAM C. HOOK,
Judge United States Circuit Court
of Appeals for the Eighth Circuit.

Endorsed: Filed in the District Court on December 26, 1918.

869 (Application for enlargement of Time to File Transcript.)

To the Honorable Judges of the United States District Court for the Western District of Oklahoma:

Now come the appealing defendants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the appealing intervenors, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, and respectfully represent that on account of unavoidable circumstances and on account of the record in this cause being a very large one on account of the testimony taken on the trial of this cause being very voluminous, consisting of depositions, official documents, oral testimony, plats, maps and evidence of other nature, and on account of the delay caused by the Influenza epidemic that prevailed in Oklahoma City in the latter part of the year 1918, and on account

of necessary delay caused in obtaining copies of exhibits introduced by the United States on the trial hereof, that were lost or mislaid, which exhibits are desired by the solicitors for the United States to be inserted and incorporated in the record herein, it will be impossible for appellants to lodge the record of this cause with the Clerk of the United States Circuit Court of Appeals of St. Louis, Missouri, by or before the 28th day of March 1919, the date on which the enlargement of time heretofore granted expires.

Appellants further represent that the record on this appeal, which has been reduced by them, is, when reduced, still a voluminous one, that [is] has been necessary to set out in said record exhibits of length that could not be abridged, that it has also been necessary to have copies made of the plats

and maps that were introduced in evidence, and that on account of these facts, it will be reasonably necessary for an extension of three months from the 28th day of March 1919, to be granted these appellants in which to file said record and docket this appeal with the Clerk of the United States Circuit Court of Appeals, and these appellants should be allowed until the 28th day of June, 1919, in which to docket this cause and file the record thereof with the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit at St. Louis, Missouri.

Wherefore, these appealing defendants and intervenors pray that they be granted an additional enlargement of time in which to docket said appeal and file the record thereof with the Clerk of the United States Circuit Court of Appeals for the Eighth Circuit at St. Louis, Missouri, until the 28th day of June, 1919, and that an order enlarging and extending the time for the docketing of this appeal and the filing of the record in said United States Circuit Court of Appeals until the 28th day of June 1919, be made and entered.

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LEDBETTER, STUART & BELL,
by H. L. Stuart,
Attorneys for Brewer-Elliott Oil &
Gas Co.

LEDBETTER, STUART & BELL,
by H. L. Stuart,
Attorneys for Pawnee-Osage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
by H. L. Stuart,
Attorneys for Chickosage Oil &
Gas Co.

LEDBETTER, STUART & BELL,
by H. L. Stuart,
Attorneys for Number One Oil Co.

A. T. BOYS,
Attorney for Arkansas Riverbed
Oil & Gas Co.

LEDBETTER, STUART & BELL,
by H. L. Stuart,
Attorneys for C. J. Haskell.

S. P. FREELING,
Attorney-General of the State of
Oklahoma,
Attorney for the State of Okla-
homa, Intervenor.

S. P. FREELING,
Attorney-General of the State of
Oklahoma.
Attorney for the Commissioners
of the Land Office of the State of
Oklahoma, Intervenors.

Endorsed: Filed in the District Court on March 18, 1919.

872 (Order, March 19, 1918, enlarging Time to File Tran-
script.)

On this the 19th day of March, 1919, there was pre-
sented to the undersigned, one of the Judges of the
United States Circuit Court of Appeals for the Eighth Cir-
cuit, the application of appealing defendants, Brewer-Elliott
Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas
Company, a corporation, Chickosage Oil & Gas Company, a
corporation, Number One Oil Company, a corporation, Ar-
kansas River Bed Oil & Gas Company, a corporation, and C.
J. Haskell, and appealing intervenors, the State of Okla-
homa and the Commissioners of the Land Office of the State of Okla-
homa, for an additional enlargement of time in which said
appealing defendants and intervenors, under the rules of the
United States Circuit Court of Appeals for the Eighth Cir-
cuit, can docket said appeal and file the record in this cause,
with the Clerk of said United States Circuit Court of Ap-
peals, which time expires on the 28th day of March, 1919.

It appearing that good cause exists and is shown for the
granting of the enlargement of time asked for in said ap-
plication,

873 It is ordered and decreed that said application be and
and the same is hereby granted, that an enlargement
of time of three months from the 28th day of March
1919, is hereby granted said appellants in which to docket
said appeal and file the record herein with the Clerk of
the United States Circuit Court of Appeals in the City of
St. Louis, Missouri, and said appellants are hereby granted
an extension and enlargement of time for the docketing of
said case and filing said record until the 28th day of June,

1919, and that the case can be docketed and said record filed in said United States Circuit Court of Appeals with the Clerk of said United States Circuit Court of Appeals by or before the 28th day of June 1919.

WILLIAM C. COOK,
Judge United States Circuit Court
of Appeals for the Eighth Circuit.

Endorsed: Filed in the District Court on March 19, 1919.

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Clerk's Certificate to Transcript.

United States of America,
Western District of Oklahoma—ss.

1. Arnold C. Dolde, Clerk of the District Court of the United States for the Western District of Oklahoma, do hereby certify the within and foregoing to be a full, true and complete transcript of the pleadings, record and proceedings in said court, in case No. 75, In Equity, wherein The United States of America is plaintiff, and The Brewer-Elliott Oil and Gas Company, et al., are defendants, and The State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, are Intervenor, as full, true and complete as the said transcript purports to contain and as called for by the precept for transcript and designation of record above set forth.

I further certify that the original citation is hereto attached and is returned herewith.

Seal
U. S. of A.
Western District
of Oklahoma.

In Testimony Whereof, I have hereunto
set my hand and affixed the seal of
said Court at office in the City of
Guthrie in said District, this 23 day
of June, A. D. 1919.

ARNOLD C. DOLDE,
Clerk.

Filed June 26, 1919, E. E. Koch, Clerk.

And thereafter the following proceedings were had in said cause, in the Circuit Court of Appeals, viz:

(Appearance of Mr. S. P. Freeling, Messrs. Ledbetter, Stuart, Bell & Ledbetter, and Mr. A. T. Boys as Counsel for the Appellants.)

United States Circuit Court of Appeals, Eighth Circuit.

No. 5434.

BREWER-ELLIOTT OIL & GAS COMPANY, a Corporation, et al.,
Appellants,

vs.

UNITED STATES OF AMERICA et al., Appellees.

The Clerk will enter my appearance as Counsel for the Appellants.

S. P. FREELING,

*Attorney General of State of Oklahoma,
Oklahoma City, Ok., Attorney for State
of Oklahoma and Commissioners of the
Land Office of Oklahoma, Appellants.*

W. A. LEDBETTER,

Oklahoma City, Ok.;

H. L. STUART,

Oklahoma City, Ok.;

R. R. BELL,

Oklahoma City, Ok.;

E. P. LEDBETTER,

Oklahoma City, Ok.;

*Attorneys for following Appellants: Brewer-
Elliott Oil & Gas Co., Pawnee-Osage Oil
& Gas Co., Chickosage Oil & Gas Co.,
Number One Oil Co., and C. J. Haskell.*

A. T. BOYS,

Oklahoma City, Oklahoma,

*Attorney for Appellant Arkansas
River Bed Oil & Gas Company.*

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Jul. 24, 1919.

*(Appearance of Mr. John H. Miley as Counsel for Appellants Except
Arkansas River Bed Oil & Gas Co.)*

The Clerk will enter my appearance as Counsel for the Appellants
except Arkansas River Bed Oil and Gas Co.

JOHN H. MILEY.

906-912 First Nat. Bank Bld., Oklahoma City, Okla.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Sep. 6, 1920.

(Appearance of Mr. James B. Diggs as Counsel for Appellees.)

The Clerk will enter my appearance as Counsel for the Appellees.
 JAMES B. DIGGS,
For Gypsy Oil Co.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Dec. 11,
 1919.

*(Appearance of Mr. John A. Fain, United States Attorney, as Counsel
 for Appellees.)*

The Clerk will enter my appearance as Counsel for the Appellees.
 JOHN A. FAIN,
United States Attorney.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Dec. 18,
 1919.

*(Appearance of Mr. Paul Pinson, Special Assistant to the Attorney
 General, as Counsel for the Appellee, United States.)*

The Clerk will enter my appearance as Counsel for the Appellee
 United States.

PAUL PINSON,
Special Asst. Atty. General.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Sep. 6, 1920.

(Order of Argument.)

September Term, 1920.

Monday, September 6, 1920.

No. 5434.

BREWER-ELLIOTT OIL & GAS COMPANY, a Corporation, et al.,
 Appellants,

vs.

UNITED STATES OF AMERICA, and THE GYPSY OIL COMPANY, a
 Corporation.

Appeal from the District Court of the United States for the Western
 District of Oklahoma.

and

No. 5435.

COMMISSIONERS OF THE LAND OFFICE OF THE STATE OF OKLAHOMA
et al., Appellants,

vs.

THE UNITED STATES et al.

Appeal from the District Court of the United States for the Western
District of Oklahoma.

These causes having been called for hearing in their regular order, upon application of counsel one hour additional time is granted for oral argument.

Thereupon, argument was commenced by Mr. W. A. Ledbetter for appellants other than the Arkansas River Bed Oil & Gas Company, and the hour for adjournment having arrived further argument was postponed until tomorrow.

(Order of Submission.)

September Term, 1920.

Tuesday, September 7, 1920.

These causes, Nos. 5434 and 5435, having been called for further hearing, argument was resumed by Mr. W. A. Ledbetter for appellants other than the Arkansas River Bed Oil & Gas Company, continued by Mr. Paul Pinson, Special Assistant to the Attorney General, for the United States of America, one of the appellees in these causes, by Mr. James B. Diggs for the Gypsy Oil Company one of the appellees in cause No. 5434, by Mr. John H. Miley for appellants other than the Arkansas River Bed Oil & Gas Company, and concluded by Mr. F. B. Owen for the riparian owners, Edmiston, Thomas and Mullendore, in case No. 5435.

Thereupon, these causes were submitted to the Court on the transcripts of the records from said District Court and the briefs of counsel filed herein.

(Opinion.)

United States Circuit Court of Appeals, Eighth Circuit, December Term, A. D. 1920.

No. 5434.

BREWER-ELLIOTT OIL AND GAS COMPANY, a Corporation, et al.,
Appellants,

vs.

UNITED STATES OF AMERICA et al., Appellees.

Appeal from the District Court of the United States for the Western
District of Oklahoma.

Mr. W. A. Ledbetter and Mr. John H. Miley (Mr. S. P. Freeling, Attorney General of Oklahoma, Mr. H. L. Stuart, Mr. R. R. Bell and Mr. E. P. Ledbetter, were on the brief), for appellants other than Arkansas River Bed Oil & Gas Co.

Mr. Paul Pinson, Special Assistant to the Attorney General (Mr. Herbert M. Peck, United States Attorney, was with him on the brief), for the appellee, United States of America.

Mr. James B. Diggs (Mr. Rush Greenslade, Mr. William C. Liedtke, Mr. R. L. Batts, Mr. D. Edward Greer and Mr. John E. Green, were with him on the brief), for the appellee, Gypsy Oil Co.

Mr. John J. Shea, Mr. Thomas F. Shea and Mr. T. Austin Gavin filed brief as amici curiæ.

Before Sanborn and Carland, Circuit Judges, and Munger, District Judge.

About 1913 oil and gas were discovered in the bed of the Arkansas River north of the thread of the main channel thereof, which was the south boundary of the lands of the Osage Tribe of Indians. Thereupon the State of Oklahoma leased to certain oil corporations parts of the bed of the Arkansas River above the mouth of the Grand River between the high water mark on the north side of the river and the thread of the main channel, and authorized them to take the oil and gas therefrom in consideration of certain royalties specified in these leases. The defendants in this case are parties claiming under these leases. In 1914 the United States, as trustee for the Osage Tribe, under the Allotment Act of June 23, 1906, 34 Stat. Secs. 2, 3, 4, pages 542, 543, and 544, claimed that these parts of the bed of the river and the oil and gas therein were the property of that tribe under grants thereof made in 1838 and 1872, and brought this suit against those claiming under these leases, for an injunction against the extraction of the oil and gas by them, and for other relief. The defendants answered that the river was navi-

gable, that the title to the leased premises between high water mark and the thread of the main channel of the river vested in the State of Oklahoma wherein these lands are situated on its admission to the Union, and that its leases were valid. The United States insisted that the river was not and never had been navigable. The State of Oklahoma and the Commissioners of its Land Office intervened and asserted the navigability of the river at the places leased and the title of the State to the premises in controversy. The parties stipulated that a receiver be appointed to collect and hold the royalties under the leases for the benefit of the party who should ultimately be adjudged entitled thereto. Such a receiver was appointed and the lessees proceeded thereafter to extract the oil and gas and pay the royalties to the receiver. The issues were tried, the court below adjudged that the river was not and never had been navigable, that the Osage Tribe was the owner of the land in the bed of the river in controversy and the oil and gas therein under the patent of the United States to the Cherokee Nation of December 1, 1838, and the treaties between them in performance of which that patent was made and delivered, under the Act of June 5, 1872, 17 Stat. 228, 229, and the deed of the Cherokee Nation to the Osage Tribe of June 14, 1883; under the treaty of July 19, 1866, 14 Stat. 799; under the treaty between the United States and the Osage Tribe of September 29, 1865, 14 Stat. 687, 690, Article 16; and under the Act of July 15, 1870, 16 Stat. 362, in pursuance of which that deed to the Osage Tribe was made. Thereupon the court rendered a decree in favor of the United States for the benefit of the Osage Tribe for the relief sought by the United States in its complaint. The defendants and the intervenors appealed from this decree.

SANBORN, *Circuit Judge*, after stating the facts as above, rendered the opinion of the court.

The appellants assigned twelve alleged errors in the hearing and disposition of this case, but when reduced to their lowest terms they present only two questions that, in the view the court takes of the facts and the law, it is necessary to consider and decide. Those questions are: (1) Did the court below make a mistake of fact in its finding that the Arkansas River was not navigable at the place of the premises in controversy? (2) If it was not mistaken in its finding of fact upon that subject, did it fall into an error of law because although that river was not and never had been in fact navigable it did not hold and adjudge as a matter of law that it was navigable and that the title to its bed below high water mark and to the oil and gas therein was in the State of Oklahoma and not in the Osage Tribe in view of the decision of the Supreme Court of Oklahoma in *State v. Nolegs*, 40 Okla. 479, 486, rendered in March 1914, to that effect.

In determining whether or not the river was navigable in fact the court below stated the rule by which it measured the evidence upon that subject in these words: "It will be deemed navigable when used or susceptible of use, in its ordinary condition, as a high

way of trade and travel in the customary modes on water. * * *
To meet the test * * * a watercourse should be susceptible of use for the purposes of commerce or possess a capacity for valuable floatage in the transportation to market of the products of the country through which it runs", and it cited in support of that rule *The Daniel Ball*, 10 Wall. 557; *The Montello*, 20 Wall. 441; *United States v. Cress*, 243 U. S. 316; *United States v. Rio Grande Irrigation Co.*, 174 U. S. 690; and *Harrison v. Fite*, 148 Fed. 781, 78 C. C. A. 447. Counsel for the appellants argue that this rule was erroneous in that it failed to declare that a stream is navigable if it can be so improved as to make it useful as a highway of travel and transportation. But it is obvious that the modification of the test adopted by the court by the insertion or addition of such a declaration would immediately raise the question whether or not a stream is navigable which was not, but might be made useful for transportation purposes at an expense far above the value of its possible use, and if not, what the determining limit of such expense should be, and thus the test would be rendered indefinite and impracticable. No persuasive reason or authority has been presented or discovered for such a modification of the rule applied by the chancellor below. That rule is sustained by the decisions of the Supreme Court and of this court, and there was no error in its statement or application in the hearing and decision of this case.

Upon the issue of the navigability of the Arkansas River above the mouth of the Grand River and at the place of the leased lands a vast mass of evidence was introduced, consisting, among other items, of the Government surveys and meander lines of the river, Congressional Appropriations for its improvement, Congressional Grants of the privilege of constructing bridges over it, opinions and decisions of the officials of the Interior Department and of the Officials of the War Department at various times with reference to the river's navigability, reports of the engineers of the War Department at various times relevant to this question, testimony of engineers who had been in charge of work on the river, and of engineers who had been familiar with it, and the testimony of many other witnesses, many of whom had resided near it for many years, and all of whom were more or less acquainted with the river and its condition at various times in the past at and near the place under consideration and at other places above the mouth of the Grand River. For a more extended portrayal of this evidence reference is made to the opinion below where the District Judge with enviable patience and clarity has set down the extent and character of this evidence and expressed his opinion of its effect. *United States v. Brewer-Elliott Oil & Gas Co.*, 249 Fed. 609, 617, 624. No purpose would be served by reciting in detail here or by discussing this evidence. Suffice it to say that all the evidence on this issue and all the objections thereto have been exhaustively examined in the light of the arguments and briefs of counsel, and the conclusion is that the competent and relevant evidence on this subject leaves no doubt that the fact is, as the Court found it to be, that the Arkansas River above

the mouth of Grand River and at the place of the leased premises is not now and never has been a navigable stream.

But counsel for the appellants earnestly maintain that although the fact is that the river is and always was unnavigable at the locus in quo, the question of its navigability is a question of the local law of the State of Oklahoma, that by the local law of that state evidenced by the decision of its Supreme Court on March 10, 1914, in *State v. Nolegs*, 40 Okla. 479, the Arkansas River at the place of the leased lands in controversy is a navigable stream and that the court below ought so to have held under the established rule that the decisions of the highest tribunal of the State regarding its constitution and statutes and local law which established settled rules of property in that state are controlling authority in the courts of the United States where no question of rights under the constitution or laws of the nation and no question of general or commercial law is involved. *Lloyd, et al. v. Fulton*, 91 U. S. 479, 482; *Jaffray v. McGehee*, 107 U. S. 361, 364-5; *Detroit v. Osborne*, 135 U. S. 492; *Paine v. Wilson*, 146 Fed. 488, 489, 77 C. C. A. 44, 45; *First Nat. Bank of Humboldt, Neb. v. Glass et al.*, 79 Fed. 706, 708, 25 C. C. A. 151, 153.

But there is an exception to this rule as just, as salutary and as firmly established as the rule itself. It is that when transactions have been had, contracts, grants, or conveyances have been made, and rights have thereby accrued and vested in a state of the laws and under the rules of property under which such rights are valid and enforceable and the claim is asserted that by decisions of state tribunals subsequent to the accrual of such rights a different rule of property and state of the law has been created, which, if applied to the determination of the effect of such prior transactions, contracts, grants or conveyances, would invalidate them and destroy the vested rights under them, the Federal Courts are not bound by such later rule of property or state of local law, the power is conferred and the duty is imposed upon them to hear and determine the claims of the parties in interest as in right and reason they ought to determine them according to the dictates of their own opinions as independent tribunals. *Burgess v. Seligman*, 107 U. S. 20, 33, 34, 35; *Great Southern Hotel v. Jones*, 193 U. S. 532, 542, 548; *Kuhn v. Fairmount Coal Co.*, 215 U. S. 349, 356; *Kobey v. Hoffman, et al.*, 229 Fed. 486, 488, 143 C. C. A. 554, 556; *Pleasant Township v. Aetna Life Ins. Co.*, 138 U. S. 67, 73; *Westinghouse Air Brake Co. v. Kansas City Southern Ry. Co.*, 137 Fed. 26, 35, 71 C. C. A. 1, 10; *Speer v. Board of County Commissioners*, 88 Fed. 749, 760, 32 C. C. A. 101, 112; *U. S. Savings & Loan Co. v. Harris*, 113 Fed. 26, 27, 28, 38, 39; *Clapp v. Otoe County*, 104 Fed. 473, 476, 45 C. C. A. 579, 582. The case of *Kuhn v. Fairmount Coal Company*, 215 U. S. 349, 355, 356, presented this question under a state of facts analogous, so far as this question is concerned, to those in this case, and the Supreme Court said: "When contracts and transactions are entered into and rights have accrued under a particular state of the local decisions, or when there has been no decision by the state court on the particular question involved, then the Federal Courts prop-

erly claim the right to give effect to their own judgment as to what is the law of the state applicable to the case, even where a different view has been expressed by the state court after the rights of parties accrued". (page 360).

Now the right and title of the Osage tribe to the bed of the river north and east of the thread of its main channel and to the oil and gas therein at the place of the leased premises accrued and vested in its predecessor in interest, the Cherokee Nation on December 1, 1838, under the patent of the United States of that date and the treaties between the United States and the Cherokee Nation of May 6, 1828, 7 Stat. 311; of February 14, 1833, 7 Stat. 414, 415, 416; and of December 29, 1835, 7 Stat. 478, in execution of which that patent was made and delivered. By its express terms the grant of that patent conveyed a tract of land which included within its boundaries both banks of the Arkansas River and the land under it at the place of the leased premises. This right and title of the Cherokee Nation to the portion of the bed of the river here in controversy which lies north and east of the main channel of the river was conveyed and confirmed to the Osage Tribe by the Act of Congress of June 5, 1872, 17 Stat. 228, 229; and by the deed of the Cherokee Nation to that tribe of June 14, 1883, which was made in performance of the treaty between the United States and the Cherokee Nation of July 19, 1866, Articles 15 and 16, 14 Stat. 799; of the treaty between the United States and the Osage Tribe of September 29, 1865; and of the Act of Congress of July 15, 1870, 16 Stat. 362. So it was that the title and rights of the Osage Tribe to the property in controversy accrued and vested in its predecessor in interest more than seventy years before the local rule of property counsel for the State invoke to the effect that the Arkansas River is navigable in law although it is not and has never been navigable in fact was declared in the region where the property in controversy is situated. There was no such rule of law in the region where the leased premises are situated when the right and title claimed by the Osage Tribe accrued and vested in the Cherokee Nation in 1838, or when it was confirmed to and vested in the Osage Tribe in 1872 and 1883. At those times and long after, the established and prevailing rules of law were that the navigability of this river was a question of fact determinable by the evidence under the definition of navigability already discussed, and the decision and opinion of the Supreme Court of Oklahoma in the *Nolegs* case has not relieved the national courts of the duty to consider and determine the claims to the premises in controversy arising under the patent, the treaties, and the deeds under which the Osage Tribe claims according to their opinions as independent tribunals. The court below so considered and decided them and the only question remaining is whether or not it fell into an error of law in its conclusion that in view of the fact that the river was not and never had been navigable in fact, it could not rightly be held to be navigable in law to the destruction or impairment of the rights which accrued and vested in the Osage Tribe under the treaties and conveyances to which reference has been made.

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The theory of counsel for the state is that if this river is navigable the United States held the title to the bed of the river below high water mark until the admission of Oklahoma into the Union in 1907, when that title vested in the State, but that if it was not navigable the title to the bed in controversy vested in the Osage tribe. This theory ignores the grave question whether or not the United States did not by the treaties and grants, to which reference has been made, vest in the Cherokee Nation in 1838 and thereafter in the Osage Tribe its successor in interest, the title to this property even if the river was navigable. *Shively v. Bowlby*, 152 U. S. 1, 48, 58; *Alaska Pacific Fisheries v. United States*, 248 U. S. 78, 87, 90; *United States v. Romaine, et al.*, 255 Fed. 253, 260, 166 C. C. A. 423, 430; *Knight v. U. S. Land Association*, 142 U. S. 161, 183, 184. As, in the view we take of the evidence and the law in this case, it is not necessary to a disposition of it to discuss and decide this question, we lay it aside without intimating any opinion upon it. Conceding, but not deciding or admitting that counsels' theory is sound, we consider the question now in hand whether in the construction and application of the treaties, Acts of Congress, and conveyances under which the Osage Tribe holds, the court below erred in deciding that so far as the navigability of the river conditions that tribe's title, it was not and is not navigable in law while it is not and never was navigable in fact.

In the consideration of this question the facts must be borne in mind that the rights here judicable took their rise and rest, not only in contracts but in treaties between nations, that they accrued and vested more than half a century ago, that these treaties, Acts of Congress, and conveyances must be considered and interpreted in the light of the times and circumstances in which they were made, that the intention of the parties when they were made, if ascertainable from them and the circumstances surrounding them, should be carried into effect unless clearly violative of some established law or public policy, that these treaties, conveyances, and the negotiations and transactions whose results they embody were between a powerful nation of learned and intelligent people on the one hand and in their language, and Indian Nations or Tribes on the other unfamiliar with the language and the laws of the United States and largely dependent upon that nation; that these treaties, conveyances and transactions between the United States and these Indian Nations must under these circumstances be construed, applied, and enforced, "not according to the technical meaning of their words to learned lawyers, but in the sense in which they would naturally be understood by the Indians," *Jones v. Meehan*, 175 U. S. 1, 11, "as justice and reason demand in all cases where power is exerted by the strong over those to whom they owe care and protection" and "inequality is to be made good by the superior justice which looks only to the substance of the right without regard to technical rules," *Choctaw Nation v. United States*, 119 U. S. 1, 28; *Seufert Bros. Co. v. United States*, 249 U. S. 194, 198.

The intention of the parties when the treaties and conveyances under consideration were made is the important element in the de-

termination of the rights of the Osage Tribe under them. In view of the facts that the United States conveyed, pursuant to the agreements in the treaties to the Cherokee Nation in December, 1838, a tract of land which included the lands on both banks of the Arkansas River and the land under it at the location of the leased premises, that by the Act of 1872, the deed of 1883 from the Cherokee Nation to the Osage Tribe, and the treaties and Acts of Congress on which they were founded, the United States and the Cherokee Nation confirmed and conveyed to that tribe the land and the premises in controversy bounded on the south by the Act of 1872 by "The main channel of the Arkansas River" that at the time of these conveyances and treaties that river was not and has never since been in fact navigable, that there was no established rule of law at those times in that country to the effect that that river or any other such river, though unnavigable in fact, was navigable in law, it is incredible that it could have been the intention of the United States and these Indian tribes to except from these grants that which by their plain terms they included, the portions of the bed of the Arkansas River below high water mark. The terms of the treaties and the conveyances, the times and circumstances under which they were made, the objects the parties to them sought to attain thereby, the facts that the Indian Tribes took and occupied the lands thus conveyed, all converge with compelling force to persuade that the United States and these Indian tribes intended, by these grants and conveyances and the treaties on which they were founded, to convey to and vest in the Osage Tribe of Indians the right and title to the leased premises here in dispute, that by those treaties, Acts of Congress and conveyances they did so convey and vest that right and title so that the United States had no right or title thereto as against the Osage Tribe thereafter, and the State of Oklahoma received none when it was admitted into the Union. In opposition to these views counsel for the State cite in support of their contention that the Arkansas River at the locus in quo is navigable in law, although not so in fact and that the State took the title to the leased premises in controversy on its admission into the Union, and we have read and examined among others the following authorities *State v. Nolegs*, 40 Okla. 479; *State v. Akers*, 92 Kans. 169; *United States v. Mackey*, 214 Fed. 137; *Wear v. State of Kans.*, 154 U. S. 154; *Dana v. Hurst*, 86 Kans. 947; *State v. Wabash Paper Co.*, 51 N. E. (Ind.) 949, 950; *Martin v. Waddell*, 16 Peters 366, 368; *Ill. Cent. Ry. Co. v. Illinois*, 146 U. S. 387; *Case v. Loftus*, 39 Fed. 730; *Woods v. Hustis*, 17 Wis. 417, 418; *United States v. Chandler-Dunbar Water Power Co.*, 229 U. S. 53, 57; *Weber v. Harbor Commissioners*, 85 U. S. 57; *Hinman v. Warren*, 6 Ore. 409; *McGilvra v. Ross*, 215 U. S. 70; *In Re Hericon Drainage District*, 136 Wis. 227. *In State v. Nolegs*, *State v. Akers*, and *United States v. Mackey* the claims adverse to those of the State to rights or titles to the bed of the Arkansas River below high water mark were derived from grants or conveyances made before the respective states were admitted. But it seems to us that in those cases insufficient considera-

tion and weight were given to the existing law, the facts and circumstances surrounding the parties to the original grants by the United States at the times they were made respectively, to the intentions of the parties to those grants at those time evidenced by the grants themselves and the circumstances surrounding the parties, and to the rules for the interpretation and application of treaties, contracts and transactions between the United States and Indian tribes. *Wear v. Kansas*, 245 U. S. 154, upon which much reliance seems to be placed, is not decisive or persuasive upon the real question at issue here, the question whether or not grants by the treaties, the patent thereunder, an Act of Congress and a deed from the Cherokee Nation to the Osage Tribe, all made when the law and fact were that the river was unnavigable, must be adjudged void because more than seventy years after the original grant and more than thirty years after the conveyance of the rights thereunder to the Osage Tribe the Supreme Court of a state admitted in 1907 adjudged that river to be navigable at law while it remained unnavigable in fact. There is a wide and radical difference between the construction and effect that ought to be given to such grants conditioned by the navigability of a stream and to the customary patents of the United States so conditioned issued under general laws and the respective states of the law on this subject in later years. In the *Wear* case the claimant adverse to the State relied upon the usual patent issued under the general laws by the United States in 1860. The only question really decided by the Supreme Court was that where the highest tribunal of a state, in that case of the State of Kansas, "takes upon itself to know without evidence whether the principal river of the state is navigable at the Capitol of the state we certainly can not pronounce it error." In that case the record before the Supreme Court of the United States did not require it to, and it did not consider whether or not on all the evidence and the law that eminent counsel could assemble, the river was navigable at the time of the grant under the facts and the law then applicable as the court below was required to do in this case and as this court must do. It would be a futile task to review the other authorities which counsel for the State have cited. Most of the claims for title to the beds of rivers below high water mark adverse to the claims of the states disclosed by them, accrued after the admission of the states, under general laws and have little relevancy to the question in the case at bar. Some of them involve the extent of the jurisdiction of the United States over navigable streams under its power to regulate commerce. In many of them the crucial question conditioned the rights in beds of rivers concededly navigable while the grants here involve rights in a stream which was never navigable in fact and whose navigability as a matter of law at the time of the grants conditioned their extent and validity. The study of the question in hand has not been confined to the authorities which have been referred to in this opinion, or to those cited in the briefs and arguments, and the result of our investigation and deliberation is that nothing has been discovered which convinces that the following propositions are not sustained by the evidence in this case, the better

reasons and the weight of authority, or that they are not decisive of the questions under discussion and of this case.

The United States has always been both sovereign and proprietor in its territories. As such it has always had the right and power to dispose absolutely of any of its public land therein, high or low, wet or dry. While it has held its public lands in its territories below high water mark under navigable waters in trust for future states, while it has not conveyed them by general laws and has acted upon the policy, unless in some case of International duty or public exigency, of leaving the administration and disposition of the sovereign rights in navigable waters and in the soil under them to the control of future states when they should be admitted to the Union, nevertheless, it has always possessed and has frequently exercised the absolute power to grant such lands and any interest it had in them irrevocably whenever it became necessary to do so to perform International obligations or to carry out other public purposes appropriate to the objects for which it has held the lands in its territories. *Shively v. Bowlby*, 152 U. S. 1, 48, 58; *McGilvra v. Ross*, 215 U. S. 70, 79; *Goodtitle v. Kibbe*, 9 How. 471, 478; *San Francisco City and County v. Le Roy*, 138 U. S. 656, 670, 671; *Knight v. U. S. Land Association*, 142 U. S. 161, 183, 184; *Winters v. United States*, 207 U. S. 564, 576, 577; *United States v. Winans*, 198 U. S. 371, 381; *United States v. Romaine*, 255 Fed. 253, 260, 166 C. C. A. 423, 430; *Alaska Pacific Fisheries v. United States*, 248 U. S. 78, 87, 88, 90.

It has never held its public lands in the territories under unnavigable waters under any such trust, but it has always had and exercised the absolute right to grant and dispose of such lands absolutely as appurtenant to and parts of the property granted or conveyed by it to the riparian owners of the banks adjacent thereto according to the existing law upon the subject of the rights of riparian owners at the times of the respective grants. Such riparian grantees and owners under the Acts of Congress and under the law applicable in 1838, 1872 and 1883 at the place where these leased premises lie became the owners of the beds of unnavigable streams to the respective threads thereof. *R. S. Sec. 476*; *U. S. Comp. Stat. 1913, Sec. 4918*; *Railroad Company v. Schurmeier*, 7 Wall. 272, 287. Such a riparian right of the owner of the bank to the bed of the stream was a valuable one which "When once vested, the owner can only be deprived of in accordance with established law, and if it be necessary that it be taken for the public good, upon due compensation." *Yates v. Milwaukee*, 77 U. S. 497, 504. The United States by its patent of 1838, in performance of its treaties with the Cherokee Nation granted and guaranteed to that Nation a tract of land which included the banks on both sides of the Arkansas River at the place of the leased property here in controversy, and that grant conveyed the bed of the river between these banks. *Donnelly v. United States*, 228 U. S. 243, 259. According to the law applicable to the subject and to this grant when it was made, the test of the navigability of the river was its navigability in fact and it is not now and never has been so navigable. There was not at the time of the orig-

inal grant in 1838 or when the title thus granted was vested in the Osage Tribe under the act of 1872 and the deed of 1883 any general or local law conditioning these grants to the effect that the Arkansas River at the place of the leased premises though unnavigable in fact was navigable in law. Those grants therefore divested the United States of all right and title to that part of the bed of the Arkansas River here in controversy and vested that right and title in the Osage Tribe. When the State of Oklahoma in 1907 came into the Union the United States had no beneficial right, title, or interest in that portion of the leased premises here in controversy, the State of Oklahoma never received or had any such right or interest, there was no error of law or of fact in the decision of the court below, and its judgment must be affirmed. It is so ordered.

Filed December 14, 1920.

(Decree.)

United States Circuit Court of Appeals, Eighth Circuit, December Term, 1920.

No. 5434

Tuesday, December 14, 1920.

BREWER-ELLIOTT OIL AND GAS COMPANY, a Corporation; PAWNEE-Osage Oil and Gas Company, a Corporation; Chickosage Oil and Gas Company, a Corporation; Number One Oil Company, a Corporation; Arkansas River Bed Oil and Gas Company, a Corporation; C. J. Haskell, The State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, Appellants,

vs.

UNITED STATES OF AMERICA and THE GYPSY OIL COMPANY, a Corporation.

Appeal from the District Court of the United States for the Western District of Oklahoma.

This cause came on to be heard on the transcript of the record from the District Court of the United States for the Western District of Oklahoma, and was argued by counsel.

On consideration whereof, it is now here ordered, adjudged and decreed by this Court, that the decree of the said District Court, in this cause, be, and the same is hereby, affirmed without costs to either party in this Court.

December 14, 1920.

(Affidavit as to Value of Property in Controversy.)

I, H. L. Stuart on oath state, that I am one of solicitors for the defendants and appellants Brewer-Elliott Oil & Gas Company, a

corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, and C. J. Haskell, and that the value of the property in controversy and in dispute in this cause, exceeds the sum of Ten Thousand (\$10,000.00) Dollars, exclusive of interest and costs.

H. L. STUART.

Subscribed and sworn to before me by the said H. L. Stuart, on this the 5th day of March, 1921.

[SEAL]

BEATRICE GIVAN,
Notary Public, Oklahoma County, Okla.

My commission expires June 1, 1921.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

(Stipulation and Agreement as to Value of Property in Controversy.)

Whereas, it is desired by the appellants to prosecute an appeal from the judgment rendered in the above cause by the United States Circuit Court of Appeals for the Eighth Circuit, on the 14th day of December, 1920, to the Supreme Court of the United States, and

Whereas, the printed transcript of the record of said cause in said Circuit Court of Appeals may not definitely show the value of the property in controversy in said cause,

Now, therefore, it is hereby stipulated and agreed by and between the parties that the value of the property in controversy and in dispute in this cause exceeds the sum of Ten Thousand (\$10,000.00) Dollars, exclusive of interest and costs.

Witness our hands on this the 2nd day of March A. D. 1921.

PAUL PINSON,

*Special Asst. to the Attorney General, Solicitors
for the Appellee United States of America.*

W. A. LEDBETTER,

H. L. STUART,

*Solicitors for Brewer-Elliott Oil & Gas Co., a
Corporation, Pawnee-Osage Oil & Gas Co., a
Corporation, Chickosage Oil & Gas Co., a Cor-
poration, Number One Oil Company, a Corpo-
ration, and C. J. Haskell, Appellants.*

E. E. BLAKE &

A. T. BOYS,

*Solicitors for Arkansas River Bed Oil & Gas
Co., a Corporation, Appellant.*

S. P. FREELING,

*Attorney General of State of Oklahoma, Solicitor
for the State of Oklahoma, and the Commis-
sioners of the Land Office of the State of Okla-
homa, Appellants.*

JAMES B. DIGGS,

Solicitor for Gypsy Oil Company, Appellee.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

(Petition for Appeal to Supreme Court U. S.)

To the Honorable Judges of the United States Circuit Court of Appeals for the Eighth Circuit:

Now come the petitioners, to-wit, the following defendants and appellants in the above cause, Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the interveners and appellants, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and respectfully represent that they conceive themselves aggrieved by the decree and judgment rendered and entered in the above numbered and entitled cause on the 14th day of December, 1920, by the United States Circuit Court of Appeals for the Eighth Circuit, affirming the decree of the District Court of the United States for the Western District of Oklahoma in said cause.

Said defendants and appellants and said interveners and appellants further represent that the jurisdiction of said Circuit Court of Appeals was dependent upon the fact that the United States of America was party appellee in said action suing for itself and as trustee and guardian for the Osage Tribe of Indians in Oklahoma, that said action was based on Federal questions otherwise cognizable by a Federal Court; that the jurisdiction of the District Court of the United States for the Western District of Oklahoma did not depend exclusively upon diversity of citizenship, that the amount involved herein and in controversy and dispute herein, largely exceeds the sum of Ten Thousand (\$10,000.00) Dollars, exclusive of interest and costs, and this is not a case in which the jurisdiction of the Circuit Court of Appeals is made final.

Said defendants and appellants and said interveners and appellants further represent that they desire to appeal from said decree and judgment to the Supreme Court of the United States, that said appeal to the Supreme Court of the United States be allowed by the United States Circuit Court of Appeals for the Eighth Circuit, that an order be made and entered directing that the transcript of the record and proceedings and papers upon which said decree and judgment was made and entered, duly authenticated, be sent to the Supreme Court of the United States, and that an order be made and entered herein fixing the amount of security which said defendants and appellants and said interveners and appellants will be required to furnish on said appeal.

Said defendants and appellants and said interveners and appellants herewith submit their assignment of errors.

Wherefore, the petitioners, to-wit said defendants and appellants and said interveners and appellants, respectfully pray that they be allowed an appeal herein to the Supreme Court of the United States, that the transcript of the records and proceedings and papers

upon which said decree and judgment was made and entered, duly authenticated, be sent to the said Supreme Court of the United States, and that an order be made and entered fixing the amount of security which said petitioners will be required to furnish on said appeal.

W. A. LEDBETTER,
H. L. STUART,

Solicitors for Brewer-Elliott Oil & Gas Company, a Corporation; Pawnee-Osage Oil & Gas Company, a Corporation; Chickosage Oil & Gas Company, a Corporation; Number One Oil Company, a Corporation, and C. J. Haskell, Appellants.

E. E. BLAKE &
A. T. BOYS,

Solicitors for Arkansas River Bed Oil & Gas Company, a Corporation, Appellant.

S. P. FREELING,
Attorney General of the State of Oklahoma, Solicitor for the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, Appellants.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

(Assignment of Errors on Appeal to Supreme Court U. S.)

Now come the defendants and appellants, Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation and C. J. Haskell, and the interveners and appellants, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, and respectfully allege that the following errors occurred in the proceedings and final decree in the above styled cause in the United States Circuit Court of Appeals for the Eighth Circuit:

I.

The Honorable Circuit Court of Appeals erred in holding that the trial court did not make a mistake of fact in its finding that the Arkansas River was not navigable at the place of the premises in controversy.

II.

The Honorable Circuit Court of Appeals erred in holding that the trial court did not fall into an error of law in holding that the Arkansas River at the place in controversy, was not navigable as a matter of law, and that the title to the bed of the Arkansas River below highwater mark, and the oil and gas therein *was* not in the State of Oklahoma.

III.

The Honorable Circuit Court of Appeals erred in not holding that the question of navigability of the Arkansas River at the place of the premises in controversy is to be decided by the local law of the State of Oklahoma.

IV.

The Honorable Circuit Court of Appeals erred in not following and being bound by the decision of the Supreme Court of Oklahoma rendered on March 10, 1914, in case of State v. Nolegs, reported in 40 Okla. 479, 139 Pac. 943.

V.

The Honorable Circuit Court of Appeals erred in not sustaining the fourth assignment of error of these defendants and appellants and interveners and appellants in said Circuit Court of Appeals, said fourth assignment reading:

"The Court erred in finding and holding that the issue of navigability is one of fact only and that a river is not navigable *unless so in fact.*"

VI.

The Honorable Circuit Court of Appeals erred in not sustaining the eleventh assignment of error of these defendants and appellants and interveners and appellants in said Circuit Court of Appeals, said eleventh assignment of error reading:

"The Court erred in not holding that the title to the bed of the Arkansas River throughout the State of Oklahoma and particularly at the location of the leases in controversy herein below the high water mark on either side of said river was in the State of Oklahoma."

VII.

The Honorable Circuit Court of Appeals erred in not sustaining the twelfth assignment of error of these defendants and appellants, in said Circuit Court of Appeals, said twelfth assignment of error reading:

"The Court erred in refusing to follow and be bound by the decision of the Supreme Court of the State of Oklahoma in the case of *State v. Nolegs*, 40 Okla. 479, 139 Pac. 943, wherein the Supreme Court of the State of Oklahoma held and adjudged that the Arkansas River throughout the State of Oklahoma is a navigable stream and that the title to the bed of said River is in the State of Oklahoma."

VIII.

The Honorable Circuit Court of Appeals erred in holding that the Osage Tribe of Indians were vested with title to a tract of land including the banks on both sides of the Arkansas River at place of leased property in controversy in this cause and to the bed of said Arkansas River between the said banks prior to the time in 1907 when the State of Oklahoma came into the Union.

IX.

The Honorable Circuit Court of Appeals erred in holding that when the State of Oklahoma in 1907 came into the Union, the United States had no beneficial right, title or interest in that portion of the leased premises in controversy in this cause and the State of Oklahoma never received or had any such right or interest in said leased premises.

X.

The Honorable Circuit Court of Appeals erred in not holding that the Arkansas River at the place of the premises in controversy in this cause was navigable in law and that the title to the bed of the Arkansas River throughout the State of Oklahoma and particularly at the location of the leases in controversy herein below the high water mark on either side of said River was in the State of Oklahoma.

XI.

The Honorable Circuit Court of Appeals erred in holding that the title to the bed of the Arkansas River below the high water mark and the title and ownership of the oil and gas rights, at the location of the leases in controversy herein was and is in the Osage Tribe of Indians.

Wherefore, said defendants and appellants and interveners and appellants pray that said decree of the United States Circuit Court of Appeals for the Eighth Circuit be reversed, set aside and held for

naught, and the proper judgment be rendered and entered for the defendants and appellants and interveners and appellants.

S. P. FREELING,

*Attorney General of the State of Oklahoma,
Solicitor for the State of Oklahoma and
Commissioners of the Land Office of the
State of Oklahoma, Interveners and Ap-
pellants.*

W. A. LEDBETTER,

H. L. STUART,

*Solicitors for Brewer-Elliott Oil & Gas Com-
pany, Pawnee-Osage Oil & Gas Company,
Chickosage Oil & Gas Company, Number
One Oil Company, and C. J. Haskell, De-
fendants and Appellants.*

E. E. BLAKE &

A. T. BOYS,

Solicitors for Arkansas River Bed Oil & Gas Company.

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

(Order Allowing Appeal to Supreme Court U. S.)

On this the 8th day of March, 1921, at St. Louis, Mo., in the Eastern District of Missouri, in the Eighth Circuit of the United States, came on to be heard the petition of the defendants and appellants, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, and the interveners and appellants, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, for an appeal to the Supreme Court of the United States, said petition being presented to the undersigned Judge of the United States Circuit Court of Appeals for the Eighth Circuit, said petition also asked that an order be made and entered fixing the amount of security which said defendants and appellants and said interveners and appellants will be required to furnish on said appeal. Said defendants and appellants and said interveners and appellants, also submitted their assignment of errors.

Said petition for such appeal is allowed.

It is therefore ordered, adjudged and decreed that said petition for appeal be and the same is hereby allowed as prayed for.

It is further ordered, adjudged and decreed that said defendants and appellants and said interveners and appellants, give security in the sum of One Thousand (\$1,000.00) Dollars, the same to operate as a cost bond only.

WALTER H. SANBORN,

*Judge United States Circuit Court of
Appeals, Eighth Circuit.*

Endorsed: Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

(Bond on Appeal to Supreme Court U. S.)

Know all men by these presents:

That we, the Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, as principals, and the other subscriber hereto as surety, are held and firmly bound unto the United States of America and the Gypsy Oil Company, a corporation, in the sum of One Thousand (\$1000.00) Dollars, to be paid to said United States of America and said Gypsy Oil Company, or their legal representatives, for the payment of which well and truly to be made, we bind ourselves, and each of us jointly and severally, and each of our successors, representatives and assigns firmly by these presents.

Sealed with our seals and dated this 8th day of March, 1921.

Whereas, the above named Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation, and C. J. Haskell, The State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, have taken an appeal to the Supreme Court of the United States to reverse a decree entered on the 14th day of December, 1920, in a cause wherein the said Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation and C. J. Haskell, the State of Oklahoma, and the Commissioners of the Land Office of the State of Oklahoma, are appellants, and the United States of America and Gypsy Oil Company, a corporation, are appellees, in the United States Circuit Court of Appeals for the Eighth Circuit.

Now, therefore, the condition of this obligation is such that if said Brewer-Elliott Oil & Gas Company, a corporation; Pawnee-Osage Oil & Gas Company, a corporation; Chickosage Oil & Gas Company, a corporation; Number One Oil Company, a corporation; Arkansas River Bed Oil & Gas Company, a corporation; C. J. Haskell, the State of Oklahoma and the Commissioners of the Land Office of the State of Oklahoma, will prosecute said appeal with effect and answer and pay all costs, if they fail to make good their

plea, then this obligation shall be void; otherwise to remain in full force and effect.

BREWER-ELLIOTT OIL & GAS COMPANY,
A Corporation;
 PAWNEE-OSAGE OIL & GAS COMPANY,
A Corporation;
 CHICKOSAGE OIL & GAS COMPANY,
A Corporation;
 NUMBER ONE OIL COMPANY,
A Corporation, and

C. J. HASKELL,
 By H. L. STUART,
Solicitor;

ARKANSAS RIVER BED OIL & GAS COMPANY,
 By E. E. BLAKE &
 A. T. BOYS,
Solicitors;

STATE OF OKLAHOMA AND
 COMMISSIONERS OF THE LAND OFFICE
 OF THE STATE OF OKLAHOMA,
 By S. P. FREELING,
Attorney General of State of Oklahoma, Solicitor,
Principals.

[SEAL.] NEW AMSTERDAM CASUALTY COMPANY,
 By L. N. BEADLES,
Attorney in Fact,
Surety.

Approved on this, the 8th day of March, 1921.

WALTER H. SANBORN,
Judge United States Circuit Court of
Appeals, Eighth Circuit.

* * * * *

(Copy of Power of Attorney of the New Amsterdam Casualty Company to L. N. Beadles attached to original bond.)

(Endorsed:) Filed in U. S. Circuit Court of Appeals, Mar. 8, 1921.

In the United States Circuit Court of Appeals for the Eighth Circuit.

No. 5434.

BREWER-ELLIOTT OIL AND GAS COMPANY, a Corporation, et al.,
Appellants,

vs.

UNITED STATES OF AMERICA et al., Appellees.

Citation.

United States of America to United States of America and Gypsy Oil Company, a corporation, Greeting:

You are hereby notified that in a certain cause in the United States Circuit Court of Appeals for the Eighth Circuit, being number 5434, wherein Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, C. J. Haskell, The State of Oklahoma and Commissioners of the Land Office of the State of Oklahoma, are appellants, and United States of America and Gypsy Oil Company, a corporation, are appellees, an appeal has been allowed said appellants to the Supreme Court of the United States.

You are therefore cited and admonished to be and appear before the said Supreme Court of the United States, at the City of Washington, D. C., thirty days after the date of this citation to show cause, if any there be, why the order and decree appealed from should not be corrected and speedy justice done the parties in that behalf.

Witness the Honorable Walter H. Sanborn, Judge of the United States Circuit Court of Appeals for the 8th circuit, this the 8th day of March, 1921.

WALTER H. SANBORN,

Judge U. S. Circuit Court of Appeals, Eighth Circuit.

The undersigned attorney of record and solicitor for appellee, Gypsy Oil Company, does hereby acknowledge service of a true copy of the foregoing citation on this the 11th day of March, 1921.

JAMES B. DIGGS,

Solicitor for Gypsy Oil Company, a Corporation.

STATE OF OKLAHOMA,

Oklahoma County, ss:

I, H. L. Stuart, on oath state, that on the 9th day of March, 1921, at the City of Muskogee, State of Oklahoma, in the Eastern District of Oklahoma and in the Eighth Circuit of the United States, I delivered to Paul Pinson, Special Assistant to the Attorney General of the United States and solicitor for the United States of America, in person, a certified and true and correct copy of the attached citation.

H. L. STUART.

Subscribed and sworn to before me by the said H. L. Stuart on this the 21st day of March, 1921.

[Seal Beatrice Givan, Notary Public, Oklahoma Co., Okla.]

BEATRICE GIVAN,
Notary Public, Oklahoma County, Okla.

My commission expires June 1, 1921.

[Endorsed:] U. S. Circuit Court of Appeals, Eighth Circuit. No. 5434. Brewer-Elliott Oil & Gas Company, a corporation, et al., Appellants, vs. United States of America et al., Appellees. Citation on appeal to Supreme Court U. S. with proof of service. Filed Mar. 23, 1921. E. E. Koch, clerk.

In the United States Circuit Court of Appeals for the Eighth Circuit.

No. 5434.

BREWER-ELLIOTT OIL AND GAS COMPANY, a Corporation, et al.,
Appellants,

vs.

UNITED STATES OF AMERICA et al., Appellees.

Citation.

United States of America to United States of America and Gypsy Oil Company, a corporation, Greeting:

You are hereby notified that in a certain cause in the United States Circuit Court of Appeals for the Eighth Circuit, being number 5434, wherein Brewer-Elliott Oil & Gas Company, a corporation, Pawnee-Osage Oil & Gas Company, a corporation, Chickosage Oil & Gas Company, a corporation, Number One Oil Company, a corporation, Arkansas River Bed Oil & Gas Company, a corporation, C. J. Haskell, The State of Oklahoma and Commissioners of the Land Office of the State of Oklahoma, are appellants, and United States of America and Gypsy Oil Company, a corporation, are appellees, an appeal has been allowed said appellants to the Supreme Court of the United States.

You are therefore cited and admonished to be and appear before the said Supreme Court of the United States, at the City of Washington, D. C., thirty days after the date of this citation to show cause, if any there be, why the order and decree appealed from should not be corrected and speedy justice done the parties in that behalf.

Witness the Honorable Walter H. Sanborn, Judge of the United States Circuit Court of Appeals for the 8th circuit, this the 8th day of March, 1921.

WALTER H. SANBORN,
Judge U. S. Circuit Court of Appeals, Eighth Circuit.

(Endorsed:) U. S. Circuit Court of Appeals, Eighth Circuit. No. 5434. Brewer-Elliott Oil & Gas Company, a corporation, et al., Appellants, vs. United States of America, et al., Appellees. Citation.

United States Circuit Court of Appeals, Eighth Circuit.

I, E. E. Koch, Clerk of the United States Circuit Court of Appeals for the Eighth Circuit, do hereby certify that the foregoing two pages contain a full, true and complete copy of the citation on appeal to the Supreme Court of the United States in the case of Brewer-Elliott Oil and Gas Company, et al., Appellants, v. United States of America, et al., No. 5434 in this Court, as full, true and complete as the original thereof this day signed by Honorable Walter H. Sanborn, Judge of the United States Circuit Court of Appeals for the Eighth Circuit.

In testimony whereof, I hereunto subscribe my name and affix the seal of the United States Circuit Court of Appeals for the Eighth Circuit, at office in the City of St. Louis, Missouri, this eighth day of March, A. D. 1921.

[Seal United States Circuit Court of Appeals, Eighth Circuit.]

E. E. KOCH,
*Clerk of the United States Circuit Court of
Appeals for the Eighth Circuit.*

[Endorsed:] U. S. Circuit Court of Appeals, Eighth Circuit. No. 5434. Brewer-Elliott Oil & Gas Company, et al., Appellants, vs. United States of America, et al. Certified copy of Citation on Appeal to Supreme Court, U. S. Filed Mar. 23, 1921. E. E. Koch, clerk. Service of a copy of the foregoing citation is acknowledged this 14th day of March, 1921. Wm. L. Frierson, Solicitor General. H.

(Clerk's Certificate.)

United States Circuit Court of Appeals, Eighth Circuit.

I, E. E. Koch, Clerk of the United States Circuit Court of Appeals for the Eighth Circuit, do hereby certify that the foregoing contains the transcript of the record from the District Court of the United States for the Western District of Oklahoma as prepared and printed pursuant to the stipulation of the parties under the rules of the United States Circuit Court of Appeals for the Eighth Circuit, under the supervision of its Clerk, and full, true and complete copies of all the pleadings, record entries and proceedings, including the opinion, had and filed in the United States Circuit Court of Appeals, except the full captions, titles and endorsements omitted in pursuance of the rules of the Supreme Court of the United States in a certain cause in said Circuit Court of Appeals wherein Brewer-Elliott Oil & Gas Company, et al., were Appellants, and United States of America, et al., were Appellees, No. 5434, as full, true and complete as the originals of the same remain on file and of record in my office.

I do further certify that the original citation and proof of knowledge of service are hereto attached and herewith

I do further certify that on the fourteenth day of February 1921, a mandate was issued out of said Circuit Court of Appeals for this cause, directed to the Judges of the District Court of the United States for the Western District of Oklahoma.

In testimony whereof, I hereunto subscribe my name and affix the seal of the United States Circuit Court of Appeals for the Eighth Circuit, at office in the City of St. Louis, Missouri, this twenty-third day of March, A. D. 1921.

[Seal United States Circuit Court of Appeals, Eighth Circuit]

E. E. KOCH,

Clerk of the United States Circuit Court of Appeals for the Eighth Circuit

Endorsed on cover: File No. 28,184. U. S. Circuit Court of Appeals, 8th Circuit. Term No. 270. Brewer-Elliott Oil & Gas Company et al., appellants, vs. The United States of America and the United States Oil Company. Filed March 28, 1921. File No. 28,184.

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